General Offices/3M

3M Center
St. Paul, Minnesota 55144-1000
612/733 1110

CONTAINS NO CBI

90-8900000466

3M

July 5, 1989

Certified Mail

Document Processing Center
Office of Toxic Substances, TS-790
U.S. EPA
401 M St., S.W.
Washington, D.C. 20460

Attn: CAIR Reporting Office

Dear Sir/Madam:

Attached is a completed CAIR Reporting form for 2,4/2,6 Toluene Diisocyanate, CAS No. 26471-62-5 for the 3M facility in Cottage Grove, Minnesota.

I would like to comment on one item. The Employer I.D. No. provided in questions 1.09 and 1.10 is the 9-digit IRS number used by the 3M Company. Since only 8 blocks are provided, the first digit is entered before the first block. This number was used on the advice of the CAIR "hotline".

We are not claiming any CBI in this report.

Sincerely,

Georjean L Adams

Georjean L. Adams
Manager Regulatory Affairs
Bldg. 225-4N-16
Tele: 612/737-4795

GLA:dm
Attachment

CONTAINS NO CBI

EPA

Form Approved
OMB No. 2010-0019
Approval Expires 12-31-89

90-890000 466

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Comprehensive Assessment Information Rule

REPORTING FORM

When completed, send this form to:

Document Processing Center
Office of Toxic Substances, TS-790
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
Attention: CAIR Reporting Office

For Agency Use Only:

Date of Receipt: _____

Document
Control Number: _____

Docket Number: _____

EPA Form 7710-52

SECTION 1 GENERAL MANUFACTURER, IMPORTER, AND PROCESSOR INFORMATION

PART A GENERAL REPORTING INFORMATION

1.01 This Comprehensive Assessment Information Rule (CAIR) Reporting Form has been completed in response to the Federal Register Notice of..... [1][2] [2][2] [8][8]
mo. day year

CBI

[ ] a. If a Chemical Abstracts Service Number (CAS No.) is provided in the Federal Register, list the CAS No. ..... [0][2][6][4][7][1]-[6][2]-[5]

b. If a chemical substance CAS No. is not provided in the Federal Register, list either (i) the chemical name, (ii) the mixture name, or (iii) the trade name of the chemical substance as provided in the Federal Register.

(i) Chemical name as listed in the rule ..... N/A

(ii) Name of mixture as listed in the rule .... N/A

(iii) Trade name as listed in the rule ..... N/A

c. If a chemical category is provided in the Federal Register, report the name of the category as listed in the rule, the chemical substance CAS No. you are reporting on which falls under the listed category, and the chemical name of the substance you are reporting on which falls under the listed category.

Name of category as listed in the rule ..... N/A

CAS No. of chemical substance ..... [ ][ ][ ][ ][ ][ ]-[ ][ ]-[ ]

Name of chemical substance ..... N/A

1.02 Identify your reporting status under CAIR by circling the appropriate response(s).

CBI

Manufacturer 1

[ ] Importer 2

Processor ..... (3)

X/P manufacturer reporting for customer who is a processor 4

X/P processor reporting for customer who is a processor 5

[ ] Mark (X) this box if you attach a continuation sheet.

1.03 Does the substance you are reporting on have an "x/p" designation associated with it in the above-listed Federal Register Notice?

CBI

[ ]

Yes ..... [X] Go to question 1.04

No ..... [ ] Go to question 1.05

1.04 a. Do you manufacture, import, or process the listed substance and distribute it under a trade name(s) different than that listed in the Federal Register Notice? Circle the appropriate response.

CBI

[ ]

Yes 1

No ..... (2)

b. Check the appropriate box below:

[ ] You have chosen to notify your customers of their reporting obligations

Provide the trade name(s) .... _____

_____

[ ] You have chosen to report for your customers

[ ] You have submitted the trade name(s) to EPA one day after the effective date of the rule in the Federal Register Notice under which you are reporting.

1.05 If you buy a trade name product and are reporting because you were notified of your reporting requirements by your trade name supplier, provide that trade name.

CBI

[ ]

Trade name ..... Not Applicable

Is the trade name product a mixture? Circle the appropriate response.

Yes 1

No ..... (2)

1.06 Certification -- The person who is responsible for the completion of this form must sign the certification statement below:

CBI

[ ]

"I hereby certify that, to the best of my knowledge and belief, all information entered on this form is complete and accurate."

Georjean L. Adams	Georjean L. Adams	6/28/89
NAME	SIGNATURE	DATE SIGNED

Manager	(612) 737 - 4795
TITLE	TELEPHONE NO.

[ ] Mark (X) this box if you attach a continuation sheet.

1.07 Exemptions From Reporting -- If you have provided EPA or another Federal agency with the required information on a CAIR Reporting Form for the listed substance within the past 3 years, and this information is current, accurate, and complete for the time period specified in the rule, then sign the certification below. You are required to complete section 1 of this CAIR form and provide any information now required but not previously submitted. Provide a copy of any previous submissions along with your Section 1 submission.

CBI
[ ]

"I hereby certify that, to the best of my knowledge and belief, all required information which I have not included in this CAIR Reporting Form has been submitted to EPA within the past 3 years and is current, accurate, and complete for the time period specified in the rule."

N/A

NAME	SIGNATURE	DATE SIGNED
TITLE	( ) - TELEPHONE NO.	DATE OF PREVIOUS SUBMISSION

1.08 CBI Certification -- If you have asserted any CBI claims in this report you must certify that the following statements truthfully and accurately apply to all of those confidentiality claims which you have asserted.

CBI
[ ]

"My company has taken measures to protect the confidentiality of the information, and it will continue to take these measures; the information is not, and has not been, reasonably ascertainable by other persons (other than government bodies) by using legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding) without my company's consent; the information is not publicly available elsewhere; and disclosure of the information would cause substantial harm to my company's competitive position."

N/A

NAME	SIGNATURE	DATE SIGNED
TITLE	( ) - TELEPHONE NO.	

[ ] Mark (X) this box if you attach a continuation sheet.

PART B CORPORATE DATA

1.09 Facility Identification

CBI Name [3M Chemolite Center]

[ ] Address [High Way 61 & Co. Rd. 19]
Street

[Cottage Grove]
City

[MN] [55016]--[ ]
State Zip

Dun & Bradstreet Number .....[12-270-4067]

EPA ID Number .....[00617297696]

Employer ID Number .....[41041777775]

Primary Standard Industrial Classification (SIC) Code .....[2899]

Other SIC Code .....[2843]

Other SIC Code .....[ ]

1.10 Company Headquarters Identification

CBI Name [Minnesota Mining & Mfg. Co]

[ ] Address [194 East and Middle Road]
Street

[ ]
City

[MN] [55144]--[1000]
State Zip

Dun & Bradstreet Number .....[00-617-3082]

Employer ID Number .....[41041777775]

[ ] Mark (X) this box if you attach a continuation sheet.

1.11 Parent Company Identification

CBI Name [M][i][n][n][e][s][o][t][a][ ][M][i][n][i][n][g][ ][&][ ][M][f][g][.][ ][C][o]

[ ] Address [ ][1][9][4][ ][E][a][s][t][ ][a][n][d][ ][M][c][K][n][i][g][h][t][ ][R][d]
Street

[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][S][t][.][ ][P][a][u][l]
City

[M][N] [5][5][1][4][4]--[1][0][0][0]
State Zip

Dun & Bradstreet Number .....[0][0]-[6][1][7]-[3][0][8][2]

1.12 Technical Contact

CBI Name [ ][ ][ ][ ][ ][ ][ ][ ][ ][G][e][o][r][j][e][a][n][ ][L][ ][A][d][a][m][s]

[ ] Title [M][a][n][a][g][e][r][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Address [3][M][ ][C][e][n][t][e][r][ ][2][2][5][ ][3][N][-][0][9][ ][ ][ ][ ][ ][ ]
Street

[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][S][t][.][ ][P][a][u][l]
City

[M][N] [5][5][1][4][4]--[1][0][0][0]
State Zip

Telephone Number .....[6][1][2]-[7][3][7]-[4][7][9][5]

1.13 This reporting year is from ..... [ ][1] [8][8] to [1][2] [8][8]
Mo. Year Mo. Year

[ ] Mark (X) this box if you attach a continuation sheet.

1.14 Facility Acquired -- If you purchased this facility during the reporting year, provide the following information about the seller:

Not Applicable

CBI Name of Seller [__]

[__] Mailing Address [__]
Street

[__]
City

[__][__] [__][__][__][__][__]--[__][__][__][__]
State Zip

Employer ID Number .....[__][__][__][__][__][__][__][__]

Date of Sale .....[__][__] [__][__] [__][__]
Mo. Day Year

Contact Person [__]

Telephone Number .....[__][__][__]-[__][__][__]-[__][__][__][__]

1.15 Facility Sold -- If you sold this facility during the reporting year, provide the following information about the buyer:

Not Applicable

CBI Name of Buyer [__]

[__] Mailing Address [__]
Street

[__]
City

[__][__] [__][__][__][__][__]--[__][__][__][__]
State Zip

Employer ID Number .....[__][__][__][__][__][__][__][__]

Date of Purchase .....[__][__] [__][__] [__][__]
Mo. Day Year

Contact Person [__]

Telephone Number .....[__][__][__]-[__][__][__]-[__][__][__][__]

[__] Mark (X) this box if you attach a continuation sheet.

1.16 For each classification listed below, state the quantity of the listed substance that was manufactured, imported, or processed at your facility during the reporting year.

CBI
[ ]

Classification	Quantity (kg/yr)
Manufactured	N/A
Imported	N/A
Processed (include quantity repackaged)	74,003
Of that quantity manufactured or imported, report that quantity:	
In storage at the beginning of the reporting year	N/A
For on-site use or processing	N/A
For direct commercial distribution (including export)	N/A
In storage at the end of the reporting year	N/A
Of that quantity processed, report that quantity:	
In storage at the beginning of the reporting year	9,549
Processed as a reactant (chemical producer)	67,075
Processed as a formulation component (mixture producer)	N/A
Processed as an article component (article producer)	6928
Repackaged (including export)	N/A
In storage at the end of the reporting year	8,636

[ ] Mark (X) this box if you attach a continuation sheet.

PART C IDENTIFICATION OF MIXTURES

1.17 Mixture -- If the listed substance on which you are required to report is a mixture or a component of a mixture, provide the following information for each component chemical. (If the mixture composition is variable, report an average percentage of each component chemical for all formulations.)

CBI

[ ]

Component Name	Supplier Name	Average % Composition by Weight (specify precision, e.g., 45% ± 0.5%)
Urethane Prepolymer	3M Decatur	55%
TDI	3M Decatur	45%
		Total 100%

[ ] Mark (X) this box if you attach a continuation sheet.

2.04 State the quantity of the listed substance that your facility manufactured, imported, or processed during the 3 corporate fiscal years preceding the reporting year in descending order.

CBI

[ ] Year ending ..... [1]2] Mo. [8]7] Year

Quantity manufactured ..... NA kg

Quantity imported ..... NA kg

Quantity processed ..... 69,911 kg

Year ending ..... [1]2] Mo. [8]6] Year

Quantity manufactured ..... NA kg

Quantity imported ..... NA kg

Quantity processed ..... 55,696 kg

Year ending ..... [1]2] Mo. [8]5] Year

Quantity manufactured ..... NA kg

Quantity imported ..... NA kg

Quantity processed ..... 43,464 kg

2.05 Specify the manner in which you manufactured the listed substance. Circle all appropriate process types.

CBI

[ ] N/A

Continuous process 1

Semicontinuous process 2

Batch process 3

[ ] Mark (X) this box if you attach a continuation sheet.

2.06 Specify the manner in which you processed the listed substance. Circle all appropriate process types.

CBI

[ ]

Continuous process ..... (1)

Semicontinuous process 2

Batch process ..... (3)

2.07 State your facility's name-plate capacity for manufacturing or processing the listed substance. (If you are a batch manufacturer or batch processor, do not answer this question.)

CBI

[ ]

Manufacturing capacity ..... _____ kg/yr

Processing capacity ..... 142,523 kg/yr

2.08 If you intend to increase or decrease the quantity of the listed substance manufactured, imported, or processed at any time after your current corporate fiscal year, estimate the increase or decrease based upon the reporting year's production volume.

CBI

[ ]

	Manufacturing Quantity (kg)	Importing Quantity (kg)	Processing Quantity (kg)
Amount of increase	N/A	N/A	N/A
Amount of decrease	N/A	N/A	13,336

[ ] Mark (X) this box if you attach a continuation sheet.

2.09 For the three largest volume manufacturing or processing process types involving the listed substance, specify the number of days you manufactured or processed the listed substance during the reporting year. Also specify the average number of hours per day each process type was operated. (If only one or two operations are involved, list those.)

CBI

[ ]

	Days/Year	Average Hours/Day
Process Type #1 (The process type involving the largest quantity of the listed substance.)		
Manufactured	NA	NA
Processed	51.4	24
Process Type #2 (The process type involving the 2nd largest quantity of the listed substance.)		
Manufactured	NA	NA
Processed	130	8
Process Type #3 (The process type involving the 3rd largest quantity of the listed substance.)		
Manufactured	NA	NA
Processed	NA	NA

2.10 State the maximum daily inventory and average monthly inventory of the listed substance that was stored on-site during the reporting year in the form of a bulk chemical.

CBI

[ ]

Maximum daily inventory		kg
Average monthly inventory		kg

[ ] Mark (X) this box if you attach a continuation sheet.

2.11 Related Product Types -- List any byproducts, coproducts, or impurities present with the listed substance in concentrations greater than 0.1 percent as it is manufactured, imported, or processed. The source of byproducts, coproducts, or impurities means the source from which the byproducts, coproducts, or impurities are made or introduced into the product (e.g., carryover from raw material, reaction product, etc.).

CBI

[ ]

CAS No.	Chemical Name	Byproduct, Coproduct or Impurity[1]	Concentration (%) (specify ± % precision)	Source of Byproducts, Coproducts, or Impurities
N/A	N/A	N/A	N/A	N/A

[1]Use the following codes to designate byproduct, coproduct, or impurity:

B = Byproduct
C = Coproduct
I = Impurity

[ ] Mark (X) this box if you attach a continuation sheet.

2.12 Existing Product Types -- List all existing product types which you manufactured, imported, or processed using the listed substance during the reporting year. List the quantity of listed substance you use for each product type as a percentage of the total volume of listed substance used during the reporting year. Also list the CBI quantity of listed substance used captively on-site as a percentage of the value [ ] listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

a. Product Types[1]	b. % of Quantity Manufactured, Imported, or Processed	c. % of Quantity Used Captively On-Site	d. Type of End-Users[2]
B	100%	100%	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/ Sensitizer
D = Inhibitor/Stabilizer/Scavenger/ Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.13 Expected Product Types -- Identify all product types which you expect to manufacture, import, or process using the listed substance at any time after your current corporate fiscal year. For each use, specify the quantity you expect to manufacture, import, or process for each use as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI
[ ]

a. Product Types[1]	b. % of Quantity Manufactured, Imported, or Processed	c. % of Quantity Used Captively On-Site	d. Type of End-Users[2]
B	100%	100%	I

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.14 CBI [ ] Final Product -- Complete the following table for each type of final product manufactured, imported, or processed at your facility that contains the listed substance other than as an impurity.

a. Product Type[1]	b. Final Product's Physical Form[2]	c. Average % Composition of Listed Substance in Final Product	d. Type of End-Users[3]
N/A	N/A	N/A	N/A

[1]Use the following codes to designate product types:

A = Solvent
B = Synthetic reactant
C = Catalyst/Initiator/Accelerator/Sensitizer
D = Inhibitor/Stabilizer/Scavenger/Antioxidant
E = Analytical reagent
F = Chelator/Coagulant/Sequestrant
G = Cleanser/Detergent/Degreaser
H = Lubricant/Friction modifier/Antiwear agent
I = Surfactant/Emulsifier
J = Flame retardant
K = Coating/Binder/Adhesive and additives
L = Moldable/Castable/Rubber and additives
M = Plasticizer
N = Dye/Pigment/Colorant/Ink and additives
O = Photographic/Reprographic chemical and additives
P = Electrodeposition/Plating chemicals
Q = Fuel and fuel additives
R = Explosive chemicals and additives
S = Fragrance/Flavor chemicals
T = Pollution control chemicals
U = Functional fluids and additives
V = Metal alloy and additives
W = Rheological modifier
X = Other (specify) _____

[2]Use the following codes to designate the final product's physical form:

A = Gas
B = Liquid
C = Aqueous solution
D = Paste
E = Slurry
F1 = Powder
F2 = Crystalline solid
F3 = Granules
F4 = Other solid
G = Gel
H = Other (specify) _____

[3]Use the following codes to designate the type of end-users:

I = Industrial
CM = Commercial
CS = Consumer
H = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

2.15 CBI Circle all applicable modes of transportation used to deliver bulk shipments of the listed substance to off-site customers.

N/A

[ ] Truck 1

Railcar 2

Barge, Vessel 3

Pipeline 4

Plane 5

Other (specify) N/A 6

2.16 CBI Customer Use -- Estimate the quantity of the listed substance used by your customers or prepared by your customers during the reporting year for use under each category of end use listed (i-iv).

[ ]

Category of End Use

i. Industrial Products

Chemical or mixture ..... N/A kg/yr

Article ..... N/A kg/yr

ii. Commercial Products

Chemical or mixture ..... N/A kg/yr

Article ..... N/A kg/yr

iii. Consumer Products

Chemical or mixture ..... N/A kg/yr

Article ..... N/A kg/yr

iv. Other

Distribution (excluding export) ..... N/A kg/yr

Export ..... N/A kg/yr

Quantity of substance consumed as reactant ..... N/A kg/yr

Unknown customer uses ..... N/A kg/yr

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 3 PROCESSOR RAW MATERIAL IDENTIFICATION

PART A GENERAL DATA

3.01 Specify the quantity purchased and the average price paid for the listed substance for each major source of supply listed. Product trades are treated as purchases.
CBI The average price is the market value of the product that was traded for the listed substance.
[ ]

Source of Supply	Quantity (kg)	Average Price ($/kg)
The listed substance was manufactured on-site.	NA	NA
The listed substance was transferred from a different company site.	15,396	2.28
The listed substance was purchased directly from a manufacturer or importer.	NA	NA
The listed substance was purchased from a distributor or repackager.	45,426	2.28
The listed substance was purchased from a mixture producer.	NA	NA

3.02 Circle all applicable modes of transportation used to deliver the listed substance to
CBI your facility.
[ ]

Truck ..... (1)
Railcar 2
Barge, Vessel 3
Pipeline 4
Plane 5
Other (specify) _____ 6

[ ] Mark (X) this box if you attach a continuation sheet.

3.03 CBI a. Circle all applicable containers used to transport the listed substance to your facility.

[ ]

Bags 1

Boxes 2

Free standing tank cylinders ..... (3)

Tank rail cars 4

Hopper cars 5

Tank trucks 6

Hopper trucks 7

Drums ..... (8)

Pipeline 9

Other (specify) _____ 10

b. If the listed substance is transported in pressurized tank cylinders, tank rail cars, or tank trucks, state the pressure of the tanks.

Tank cylinders ..... N/A mmHg

Tank rail cars ..... N/A mmHg

Tank trucks ..... N/A mmHg

[ ] Mark (X) this box if you attach a continuation sheet.

PART B RAW MATERIAL IN THE FORM OF A MIXTURE

3.04 If you obtain the listed substance in the form of a mixture, list the trade name(s) of the mixture, the name of its supplier(s) or manufacturer(s), an estimate of the CBI average percent composition by weight of the listed substance in the mixture, and the amount of mixture processed during the reporting year.

[ ]

Trade Name	Supplier or Manufacturer	Average % Composition by Weight (specify ± % precision)	Amount Processed (kg/yr)
Urethane Prepolymer	3M Decatur	45%	15,396

[ ] Mark (X) this box if you attach a continuation sheet.

PART C RAW MATERIAL VOLUME

3.05 CBI [ ] State the quantity of the listed substance used as a raw material during the reporting year in the form of a class I chemical, class II chemical, or polymer, and the percent composition, by weight, of the listed substance.

	Quantity Used (kg/yr)	% Composition by Weight of Listed Substance in Raw Material (specify ± % precision)
Class I chemical	74,003	99.5 ± 0.5
Class II chemical	Not Applicable	Not Applicable
Polymer	N/A	N/A

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 4 PHYSICAL/CHEMICAL PROPERTIES

General Instructions:

If you are reporting on a mixture as defined in the glossary, reply to questions in Section 4 that are inappropriate to mixtures by stating "NA -- mixture."

For questions 4.06-4.15, if you possess any hazard warning statement, label, MSDS, or other notice that addresses the information requested, you may submit a copy or reasonable facsimile in lieu of answering those questions which it addresses.

PART A PHYSICAL/CHEMICAL DATA SUMMARY

4.01 Specify the percent purity for the three major[1] technical grade(s) of the listed substance as it is manufactured, imported, or processed. Measure the purity of the substance in the final product form for manufacturing activities, at the time you import the substance, or at the point you begin to process the substance.

CBI
[ ]

	Manufacture	Import	Process
Technical grade #1	NA % purity	NA % purity	99.5 % purity
Technical grade #2	NA % purity	NA % purity	NA % purity
Technical grade #3	NA % purity	NA % purity	NA % purity

[1]Major = Greatest quantity of listed substance manufactured, imported or processed.

4.02 Submit your most recently updated Material Safety Data Sheet (MSDS) for the listed substance, and for every formulation containing the listed substance. If you possess an MSDS that you developed and an MSDS developed by a different source, submit your version. Indicate whether at least one MSDS has been submitted by circling the appropriate response.

Yes ..... (1)

No 2

Indicate whether the MSDS was developed by your company or by a different source.

Your company ..... (1)

Another source ..... (2)

[ ] Mark (X) this box if you attach a continuation sheet.

Tox. 6-12-86

MATERIAL SAFETY DATA SHEET 4.02

DIVISION ADDRESS

Mobay Chemical Corporation
Polyurethane Division
Penn Lincoln Parkway West
Pittsburgh, Pennsylvania 15205

ISSUE DATE 11/26/85
SUPERSEDES 5/7/84

TRANSPORTATION EMERGENCY: CALL CHEMTREC
TELEPHONE NO: 800-424-9300; DISTRICT OF COLUMBIA: 202-483-7616

MOBAY NON-TRANSPORTATION EMERGENCY NO.:
412-923-1800

Rm 29714
Rm 3827

I. PRODUCT IDENTIFICATION

PRODUCT NAME.....:	Mondur TD-80 (All Grades)
PRODUCT CODE NUMBER.....:	E-002
CHEMICAL FAMILY.....:	Aromatic Isocyanate
CHEMICAL NAME.....:	Toluene Diisocyanate (TDI)
SYNONYMS.....:	Benzene, 1,3-diisocyanato methyl-
CAS NUMBER.....:	26471-62-5
T.S.C.A. STATUS.....:	On Inventory
CHEMICAL FORMULA.....:	$C_9H_6N_2O_2$

II. HAZARDOUS INGREDIENTS

COMPONENTS:	**%:**	**CURRENT LIMITS:**
2,4-Toluene diisocyanate (TDI) CAS #584-84-9	80%	ACGIH-TLV: 0.005 ppm TWA- (2,4 TDI) 0.02 ppm STEL
2,6-Toluene Diisocyanate (TDI) CAS #91-08-7	20%	OSHA-PEL: 0.02 ppm (2,4 TDI) Ceiling

III. PHYSICAL DATA

APPEARANCE.....:	Liquid
COLOR.....:	Water white to pale yellow
ODOR.....:	Sharp, pungent (odor threshold greater than TLV)
FREEZING POINT.....:	Approx. 55°F (13°C)
BOILING POINT.....:	Approx. 484°F (251°C)
VAPOR PRESSURE.....:	Approx. 0.025 mmHg @ 25°C (77°F)
VAPOR DENSITY (AIR=1)....:	6.0
SPECIFIC GRAVITY.....:	1.22 @ 25°C
BULK DENSITY.....:	10.18 lbs/gal
SOLUBILITY IN WATER.....:	Reacts slowly with water at normal room temperature to liberate CO_2 gas
% VOLATILE BY VOLUME.....:	Negligible

IV. FIRE & EXPLOSION DATA

FLASH POINT °F(°C).....: 260°F (127°C) Pensky-Martens Closed Cup

EXTINGUISHING MEDIA.....: Dry chemical (e.g. monoammonium phosphate, potassium sulfate, and potassium chloride), carbon dioxide, high expansion (proteinic) chemical foam, water spray for large fires. Caution: Reaction between water or foam and hot TDI can be vigorous.

SPECIAL FIRE FIGHTING PROCEDURES/UNUSUAL FIRE OR EXPLOSION HAZARDS: Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by fire fighters. During a fire, TDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. (See Section VIII.) At temperatures greater than 350°F (177°C) TDI forms carbodiimides with the release of CO_2 which can cause pressure build-up in closed containers. Explosive rupture is possible. Therefore, use cold water to cool fire-exposed containers.

V. HEALTH EFFECTS DATA

ANIMAL TOXICITY -

INGESTION.....: ORAL, LD50 5800 mg/kg (Rats)
SKIN CONTACT.....: DERMAL, LD50 Greater than 10 g/kg (Rabbits)
INHALATION, LC50.(4 hr): Range 12.7 to 66 ppm for 1-4 hour (Rat)
AQUATIC LC50.(24 hr)...: Greater than 500 mg/l (Daphnea, Limnea Invertebrates and Zebra Fish).
EYE EFFECTS.....: Strongly irritating (Rabbits) OECD Guidelines.
SKIN EFFECTS.....: Corrosive to the skin (Rabbits) OECD Guidelines. Skin sensitizer in guinea pigs. One study (available upon request) with guinea pigs reported that repeated skin contact with TDI caused respiratory sensitization
OTHER.....: In a draft of a lifetime bioassay, the National Toxicology Program reported that TDI caused an increase in the number of tumors in exposed rats over those counted in non-exposed rats. The TDI was administered by gavage where TDI was introduced into the stomach through a tube. In lifetime inhalation studies conducted by Hazelton Labs for the International Isocyanate Institute, TDI did not demonstrate carcinogenic activity in rats or mice.

HUMAN EFFECTS

OF OVEREXPOSURE.....: **Inhalation.** Inhalation of TDI vapors at concentrations above allowable limits can produce irritation of the mucous membranes in the respiratory tract resulting in runny nose, sore throat, productive cough and a reduction in lung function (breathing obstruction). Extensive exposures to concentrations well above these limits could lead to bronchitis, bronchospasm and, in rare cases, pulmonary edema (fluid in lungs). These effects are usually reversible. Another type of response is hyperreactivity or hypersensitivity, in which persons with a pre-existing, non-specific bronchial hyperreactivity or persons with a specific isocyanate hypersensitivity (as a result of previous repeated overexposure or a single large dose) can respond to small TDI concentrations at levels well below 0.02 ppm. Symptoms could be immediate or delayed and include chest tightness, wheezing, cough, shortness of breath or asthmatic attack. There are reports that, in individuals who have experienced asthmatic episodes, these symptoms may be brought on by exposure to dust, cold air and other irritants and may continue for some time even after removal from further TDI exposure. As reported, these symptoms can reoccur for weeks and, in severe cases, for a number of years. Hypersensitivity pneumonitis (with similar respiratory symptoms and fever which are delayed) has also been reported. One scientific study (available upon request) of workers in a TDI manufacturing plant reported that certain workers exposed to higher levels of TDI had larger declines in lung function (over the five-year period of the study) than other workers who experienced lower exposures to TDI. However, all of the worker groups in the study experienced excursions above the 0.02 ppm level. **Skin.** TDI reacts with skin protein and tissue moisture and can cause localized irritation as well as discoloration. Prolonged contact could produce reddening, swelling, or blistering and, in some individuals, skin sensitization resulting in dermatitis. **Eyes.** Liquid, vapors, or aerosols are severely irritating to the eyes and can cause tears. Corneal injury can occur which can be slow to heal; however, the damage is usually reversible. **Ingestion.** Ingestion could result in irritation and some corrosive action in the mouth, stomach tissue and digestive tract. (See Section V).

VI. EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT.....: Flush with clean, lukewarm water (low pressure) for at least 15 minutes, occasionally lifting eyelids, and obtain medical attention. Refer individual to an opthalmologist for immediate follow-up.
SKIN CONTACT.....: Remove contaminated clothing. Wash affected areas thoroughly with soap or tincture of green soap and water. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower,

remove clothing under shower, get medical attention, and consult physician. 4.02
INHALATION.....: Move to an area free from risk of further exposure. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Consult physician.
INGESTION.....: Do not induce vomiting. Give 250 ml of milk or water to drink. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Consult physician.
NOTE TO PHYSICIAN..... **Eyes**: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision. **Skin**: Treat as contact dermatitis. If burned, treat as thermal burn. **Respiratory**: Treatment is essentially symptomatic.

VII. EMPLOYEE PROTECTION RECOMMENDATIONS

EYE PROTECTION.....: Liquid chemical goggles or full-face shield. Contact lenses should not be worn.
SKIN PROTECTION.....: Chemical resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered by the cream to a minimum.
RESPIRATORY PROTECTION...: A positive pressure air-supplied respirator is required whenever TDI concentrations exceed the Short-Term Exposure or Ceiling Limit of 0.02 ppm or exceed the 8-hour Time Weighted Average TLV of 0.005 ppm. An air-supplied respirator must also be worn during spray application, even if exhaust ventilation is used. For non-spray, short-term (less than 1 hour) situations where concentrations are near the TLV, a full-face, air-purifying respirator equipped with organic cartridges or cannisters can be used. However, TDI has poor warning properties since the odor at which TDI can be smelled is substantially higher than 0.02 ppm. Therefore, proper fit and timely replacement of filter elements must be ensured. Observe OSHA regulations for respirator use (29 CFR 1910.134).
MEDICAL SURVEILLANCE.....:Medical supervision of all employees who handle or come in contact with TDI is recommended. These should include preemployment and periodic medical examinations with respiratory function tests (FEV,FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with TDI. Once a person is diagnosed as sensitized to TDI, no further exposure can be permitted.
VENTILATION.....: Local exhaust should be used to maintain levels below the TLV whenever TDI is handled, processed, or spray-applied. At normal room temperatures (70°F) TDI levels quickly exceed the TLV unless properly ventilated. Standard reference sources regarding industrial ventilation **(e.g., ACGIH Industrial Ventilation)** should be consulted for guidance about adequate ventilation.
MONITORING.....: TDI exposure levels must be monitored by accepted monitoring techniques to ensure that the TLV is not exceeded. **(Contact Mobay for guidance)** See Volume 1 (Chapter 17) and Volume 3 (Chapter 3) in Patty's **Industrial Hygiene and Toxicology** for sampling strategy.
OTHER.....: Safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow all label instructions.

VIII. REACTIVITY DATA

STABILITY.....: Stable under normal conditions
POLYMERIZATION.....: May occur if in contact with moisture or other materials which react with isocyanates. Self-reaction may occur at temperatures over 350°F (177°C) or at lower temperatures if sufficient time is involved. See Section IV.

INCOMPATIBILITY
(MATERIALS TO AVOID)...: Water, amines, strong bases, alcohols. Will cause some corrosion to copper alloys and aluminum.

HAZARDOUS DECOMPOSITION
PRODUCTS.....: By high heat and fire: carbon monoxide, oxides of nitrogen, traces of HCN, TDI.

IX. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Cover the spill with sawdust, vermiculite, Fuller's earth or other absorbent material. Pour decontamination solution over spill area and allow to react for at least 10 minutes. Collect material in open top containers and add additional amounts of decontamination solution. Remove containers to a safe place, cover loosely, and allow to stand for 24 to 48 hours. Wash down spill area with decontamination solutions. Decontamination solutions: non-ionic surfactant Union Carbide's Tergitol TMN-10 (20%) and water (80%); or concentrated ammonia (3-8%), detergent (2%), and water (90%). During spill clean-up, a self-contained breathing apparatus or air-line respirator and protective clothing must be worn. (See Section VII.)

WASTE DISPOSAL: TDI is listed as a hazardous waste (No. U-233) under Section 261.33 (f) of RCRA. It must be disposed of in a permitted incinerator or landfill. Incineration is the preferred method. The residue from decontaminating a TDI spill is also classified as a hazardous waste under Section 261.3 (c)(2) of RCRA. Empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. DO NOT HEAT OR CUT EMPTY CONTAINER WITH ELECTRIC OR GAS TORCH. (See Sections IV. and VIII.)

X. SPECIAL PRECAUTIONS & STORAGE DATA

STORAGE TEMPERATURE
(MIN./MAX.).....: 70°F (21°C)/90°F (32°C)
AVERAGE SHELF LIFE.....: 12 months
SPECIAL SENSITIVITY
(HEAT, LIGHT, MOISTURE): If container is exposed to high heat, 375°F (177°C) it can be pressurized and possibly rupture. TDI reacts slowly with water to form polyureas and liberates CO_2 gas. This gas can cause sealed containers to expand and possibly rupture.
PRECAUTIONS TO BE TAKEN
IN HANDLING AND STORING: Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Avoid contact with skin and eyes. Do not breathe the vapors.

XI. SHIPPING DATA

D.O.T. SHIPPING NAME.....: Toluene Diisocyanate
TECHNICAL SHIPPING NAME..: Toluene Diisocyanate
D.O.T. HAZARD CLASS.....: Poison B
UN/NA NO.....: UN 2078
REPORTABLE QUANTITY.....: 1 lb.
D.O.T. LABELS REQUIRED...: Poison
D.O.T. PLACARDS.....: Poison
FRT. CLASS BULK.....: Toluene Diisocyanate
FRT. CLASS PKG.....: Chemicals NOI (Toluene Diisocyanate) NMFC 60000
PRODUCT LABEL.....: Mondur TD-80 Product Label
REASON FOR ISSUE.....: Revising the Glove Statement
APPROVED BY.....: J.H. Chapman/K.S. Booth
TITLE.....: Industrial Hygiene Polyurethane Division
DATE APPROVED.....: 11/17/85

3M MATERIAL SAFETY DATA SHEET
91.0114 ISSUE DATE: 5/16/1989 SUPERSEDES: 09-09-87
MATERIAL DESIGNATION: URETHANE POLYMER SOLUTION
3M I.D. NUMBER: 41-4100-1160-9; 41-4100-1314-2;
41-4100-2743-1; 41-4100-2803-3;
41-3900-0636-3
NFPA DIAMOND CODE: HEALTH: ND FIRE: 2 REACTIVITY: 1 OTHER: W

FOR 24-HOUR EMERGENCY INFORMATION ON HEALTH EFFECTS CALL: (612)733-2882

1. INGREDIENTS	CAS NUMBER	%	TLV(R)(UNIT)
URETHANE PREPOLYMER, ISOCYANATE TERMINATED.	===	55	NONE ESTABLISHED
TOLUENE-2,4-DIISOCYANATE+ (FREE TDI)	26471-62-5	45	0.005PPM TWA 0.02 PPM STEL*

*3M EXPOSURE GUIDELINE

+SUBJECT TO SECTION 313 SARA TITLE III

2. PHYSICAL DATA

BOILING POINT:	>480F	SOLUBILITY IN WATER:	REACTS*
VAPOR PRESSURE:	ND	SPECIFIC GRAVITY(H20=1):	1.16-1.20
VAPOR DENSITY(AIR=1):	>1	PERCENT VOLATILE:	<1%
EVAPORATION RATE:	ND	VISCOSITY:	400-1000 CPS
		PH:	NA

APPEARANCE AND ODOR: CLEAR SYRUPY LIQUID. *REACTS WITH H20 TO FORM INSOL.SOLIDS

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT(TEST METHOD): 155 F (PENSKY-MARTENS,CC) FLA.LMT. LEL:ND UEL:ND
EXTINGUISHING MEDIA: CO2, DRY CHEMICAL, FOAM, WATER FOG.
SPECIAL FIRE FIGHTING PROCEDURES: NONE
UNUSUAL FIRE AND EXPLOSION HAZARDS: PRODUCES HYDROGEN CYANIDE AND CARBON MONOXIDE IF BURNED.

4. PRECAUTIONARY INFORMATION

AVOID EYE AND SKIN CONTACT. WEAR EYE PROTECTION AND RUBBER GLOVES. AVOID INHALATION OF VAPOR. USE LOCAL EXHAUST VENTILATION ON OPEN CONTAINERS AND TRANSFER POINTS FOR CONTROL OF VAPORS. IN CASE OF SPILL OR RELEASE OF VAPOR, A SUPPLIED AIR RESPIRATOR SHOULD BE USED.

PRODUCT CODE: RD-1160 RD-1314 RD-2743
RD-2803 MC-636

5. HEALTH HAZARD DATA

EYE CONTACT: MAY CAUSE EYE IRRITATION ON CONTACT OR ON EXPOSURE TO VAPORS.

SKIN CONTACT: MAY CAUSE SKIN IRRITATION ON CONTACT.

INHALATION: VAPORS MAY BE IRRITATING. MAY CAUSE RESPIRATORY ASTHMATIC-LIKE REACTION IN SUSCEPTIBLE INDIVIDUALS.

INGESTION: ACUTE TOXICITY BY INGESTION IS EXPECTED TO BE LOW. TOLUENE DIISOCYANATE HAS CAUSED CANCER IN LAB ANIMALS WHEN INCLUDED IN THEIR DIET (NTP).

SUGGESTED FIRST AID:

EYE CONTACT: FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST TEN MINUTES AND CALL A PHYSICIAN.

SKIN CONTACT: WASH AFFECTED AREA WITH SOAP AND WATER.

INHALATION: IF RESPIRATORY SYMPTOMS OCCUR (IRRITATION, DIFFICULT BREATHING) PROVIDE NON-CONTAMINATED AIR AND GET MEDICAL ATTENTION.

INGESTION: ====

6. ENVIRONMENTAL INFORMATION

SPILL RESPONSE: OBSERVE PRECAUTIONARY INFORMATION FROM OTHER SECTIONS. EXTINGUISH IGNITION SOURCES AND UTILIZE PROTECTIVE CLOTHING. COVER THE SPILL WITH AN ABSORBENT MATERIAL. SWEEP UP. CLEAN RESIDUES WITH METHYL ETHYL KETONE (MEK) OR AN EQUIVALENT SOLVENT. PLACE ALL CLEANUP MATERIAL INTO METAL DRUM.

RECOMMENDED DISPOSAL: DISPOSE BY CHEMICAL INCINERATION.

ENVIRONMENTAL DATA: THIS PRODUCT IS NOT A HAZARDOUS WASTE AS DESIGNATED BY US EPA STANDARDS (40 CFR PART 261).

7. REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: PROTECT FROM MOISTURE.

INCOMPATIBILITY: YES

MATERIALS TO AVOID: WILL REACT WITH MOISTURE TO FORM SOLIDS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NA

HAZARDOUS DECOMPOSITION PRODUCTS: WHEN BURNED TOXIC GASES SUCH AS HYDROGEN CYANIDE AND CARBON MONOXIDE MAY BE GIVEN OFF.

INFORMATION ON THIS DATA SHEET REPRESENTS OUR CURRENT DATA AND BEST JUDGEMENT AS TO THE PROPER USE IN HANDLING OF THIS PRODUCT UNDER NORMAL CONDITIONS.

4.03 Submit a copy or reasonable facsimile of any hazard information (other than an MSDS) that is provided to your customers/users regarding the listed substance or any formulation containing the listed substance. Indicate whether this information has been submitted by circling the appropriate response.

N/A
Yes 1

N/A
No 2

4.04 For each activity that uses the listed substance, circle all the applicable number(s) corresponding to each physical state of the listed substance during the activity listed. Physical states for importing and processing activities are determined at the time you import or begin to process the listed substance. Physical states for manufacturing, storage, disposal and transport activities are determined using the final state of the product.

CBI

[ ]

	Physical State				
Activity	Solid	Slurry	Liquid	Liquified Gas	Gas
Manufacture	1	2	3	4	5
Import	1	2	3	4	5
Process	1	2	(3)	4	5
Store	1	2	(3)	4	5
Dispose	1	2	(3)	4	5
Transport	1	2	3	4	5

[ ] Mark (X) this box if you attach a continuation sheet.

4.05 Particle Size -- If the listed substance exists in particulate form during any of the following activities, indicate for each applicable physical state the size and the percentage distribution of the listed substance by activity. Do not include particles ≥10 microns in diameter. Measure the physical state and particle sizes for importing and processing activities at the time you import or begin to process the listed substance. Measure the physical state and particle sizes for manufacturing storage, disposal and transport activities using the final state of the product.

CBI
[ ]

Physical State		Manufacture	Import	Process	Store	Dispose	Transport
Dust	<1 micron	N/A	N/A	N/A	N/A	N/A	N/A
	1 to <5 microns						
	5 to <10 microns						
Powder	<1 micron						
	1 to <5 microns						
	5 to <10 microns						
Fiber	<1 micron						
	1 to <5 microns						
	5 to <10 microns						
Aerosol	<1 micron						
	1 to <5 microns						
	5 to <10 microns						

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 5 ENVIRONMENTAL FATE

PART A RATE CONSTANTS AND TRANSFORMATION PRODUCTS

5.01 Indicate the rate constants for the following transformation processes.

a. Photolysis:

Absorption spectrum coefficient (peak) .... 871 (1/M cm) at 284 nm

Reaction quantum yield, ϕ ..... UK at ____ nm

Direct photolysis rate constant, k_p, at ... < 1.2×10^{-3} 1/hr when NO_2 photolysis rate is 0.37/hr (2)

b. Oxidation constants at 25°C:

For $^1O_2$ (singlet oxygen), k_{ox} ..... UK 1/M hr

For RO_2 (peroxy radical), k_{ox} ..... UK 1/M hr

c. Five-day biochemical oxygen demand, BOD_5 ... Not applicable due to reaction with water mg/l

d. Biotransformation rate constant:

For bacterial transformation in water, k_b ... No oxygen consumed 1/hr

Specify culture ..... in modified MITI test (3)

e. Hydrolysis rate constants:

For base-promoted process, k_B ..... UK 1/M hr

For acid-promoted process, k_A ..... UK 1/M hr

For neutral process, k_N ..... UK 1/hr

f. Chemical reduction rate (specify conditions) UK

g. Other (such as spontaneous degradation) ... Polyurea formation under hydrolytic conditions. (4)

[ ] Mark (X) this box if you attach a continuation sheet.

PART B PARTITION COEFFICIENTS

5.02 a. Specify the half-life of the listed substance in the following media.

Media	Half-life (specify units)
Groundwater	<< 1 day in water solution (4)
Atmosphere	26 hr (2)
Surface water	<< 1 day in water solution (4)
Soil	< 1 day (4)

b. Identify the listed substance's known transformation products that have a half-life greater than 24 hours.

CAS No.	Name	Half-life (specify units)		Media
Not found	Polyurea	> 1 yr	in	water and soil (4)
95-80-7	2,4-Toluene diamine	< 1 day	in	biological waste-water treatment plant (4)
823-40-5	2,6-Toluene diamine	< 1 day	in	
5206-52-0	Urea, N, N- bis (3-isocyanato-4-methylphenyl)	Unknown half-life	in	(5,6)

5.03 Specify the octanol-water partition coefficient, K_{ow} ... log 2.33 at 25°C

Method of calculation or determination ..... QSAR

5.04 Specify the soil-water partition coefficient, K_d ..... reacts with water at 25°C

Soil type .....

5.05 Specify the organic carbon-water partition coefficient, K_{oc} ..... 2.60 = log at 25°C

5.06 Specify the Henry's Law Constant, H ..... $\log_{10}$ -5.88 atm-m^3/mole

[ ] Mark (X) this box if you attach a continuation sheet.

5.07 List the bioconcentration factor (BCF) of the listed substance, the species for which it was determined, and the type of test used in deriving the BCF.

Bioconcentration Factor	Species	Test[1]
None detected	Moina macrocopa Straus	Not defined (4)
None detected	Cyprinus carpio	Not defined (4)

[1]Use the following codes to designate the type of test:

F = Flowthrough
S = Static

(1) Phillips and Nachod, eds., Organic Electronic Spectral Data, Vol. IV, pg. 200.

(2) K. H. Becker, V. Bastian and Th. Klein, The reactions of toluenediisocyanate, toluenediamine and methylenedianiline under simulated atmospheric conditions, J. Photochem. and Photobiol., A: Chemistry, 45 (1988) 195-205.

(3) N. Caspers, B. Hamburger, R. Kanne and Waklebert, Ecotoxicity of TDI, MDI, TDA and MDA, Report to the International Isocyanate Institute, E-CE-41, 1986. Quoted in D. S. Gilbert, Fate of TDI and MDI in Air, Soil and Water, Polyurethanes World Congress 1987, Proceedings of the SPI/FSK.

(4) F. K. Brochhagen and B. M. Grieveson, Environmental aspects of isocyanates in water and soil, Cellular Polymers, 3 (1984) 11-17.

(5) K. Marcali, Microdetermination of toluenediisocyanate in atmosphere, Anal. Chem. 29 (1957) 552-558.

(6) G. A. Campbell, T. J. Dearlove and W. C. Meluch, Di (isocyanatotolyl) urea, U.S. Patent 3,906,019 (1975), Chem. Abs. 84:5655h.

[ ] Mark (X) this box if you attach a continuation sheet.

6.04 CBI [ ] For each market listed below, state the quantity sold and the total sales value of the listed substance sold or transferred in bulk during the reporting year.

Market	Quantity Sold or Transferred (kg/yr)	Total Sales Value ($/yr)
Retail sales		
Distribution -- Wholesalers		
Distribution -- Retailers		
Intra-company transfer		
Repackagers		
Mixture producers		
Article producers		
Other chemical manufacturers or processors		
Exporters		
Other (specify)		

6.05 CBI [ ] Substitutes -- List all known commercially feasible substitutes that you know exist for the listed substance and state the cost of each substitute. A commercially feasible substitute is one which is economically and technologically feasible to use in your current operation, and which results in a final product with comparable performance in its end uses.

Substitute	Cost ($/kg)
Unknown	

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 7 MANUFACTURING AND PROCESSING INFORMATION

General Instructions:

For questions 7.04-7.06, provide a separate response for each process block flow diagram provided in questions 7.01, 7.02, and 7.03. Identify the process type from which the information is extracted.

PART A MANUFACTURING AND PROCESSING PROCESS TYPE DESCRIPTION

7.01 In accordance with the instructions, provide a process block flow diagram showing the major (greatest volume) process type involving the listed substance.

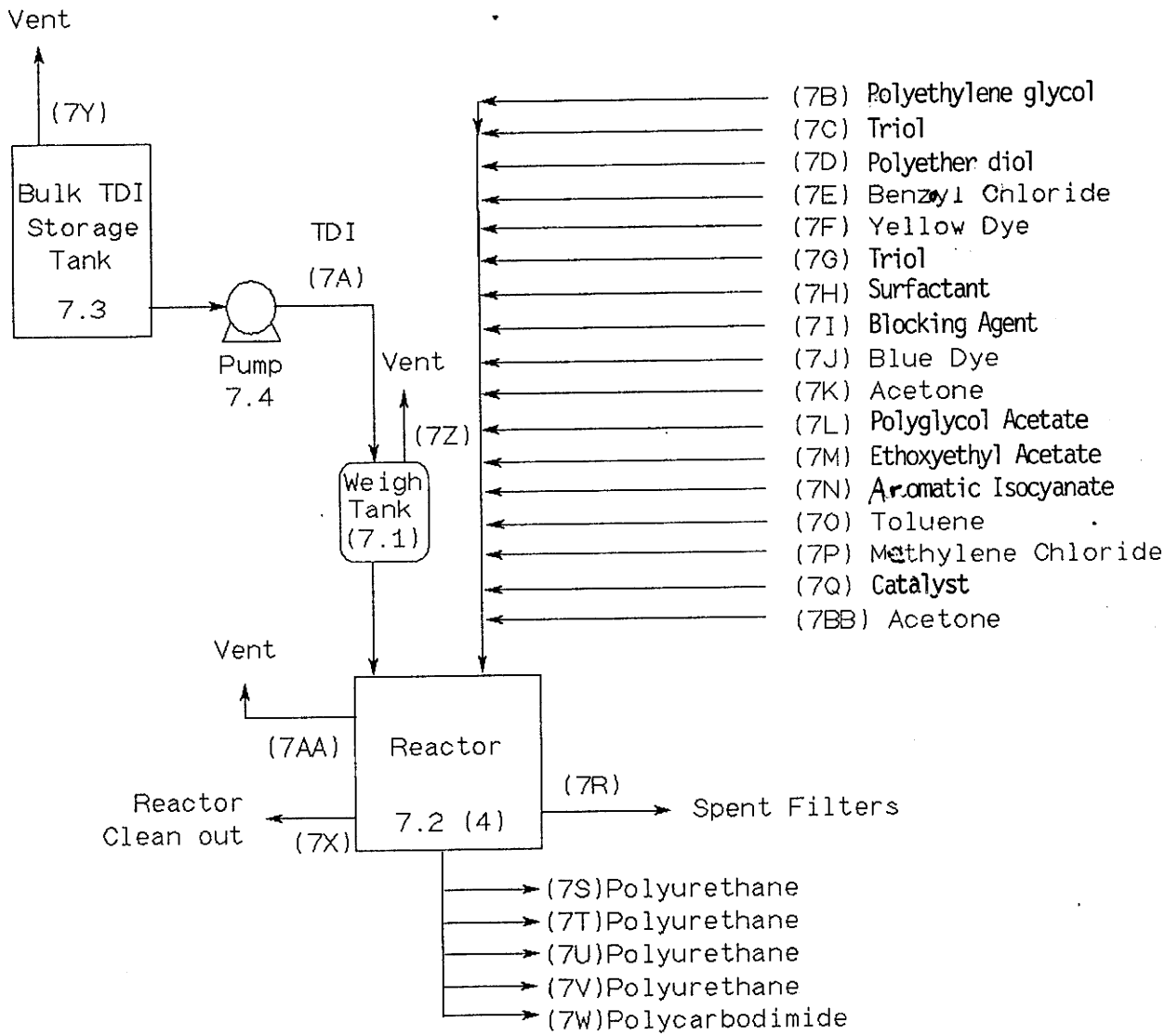
CBI

[ ] Process type ..... Batch TDI Polymerization

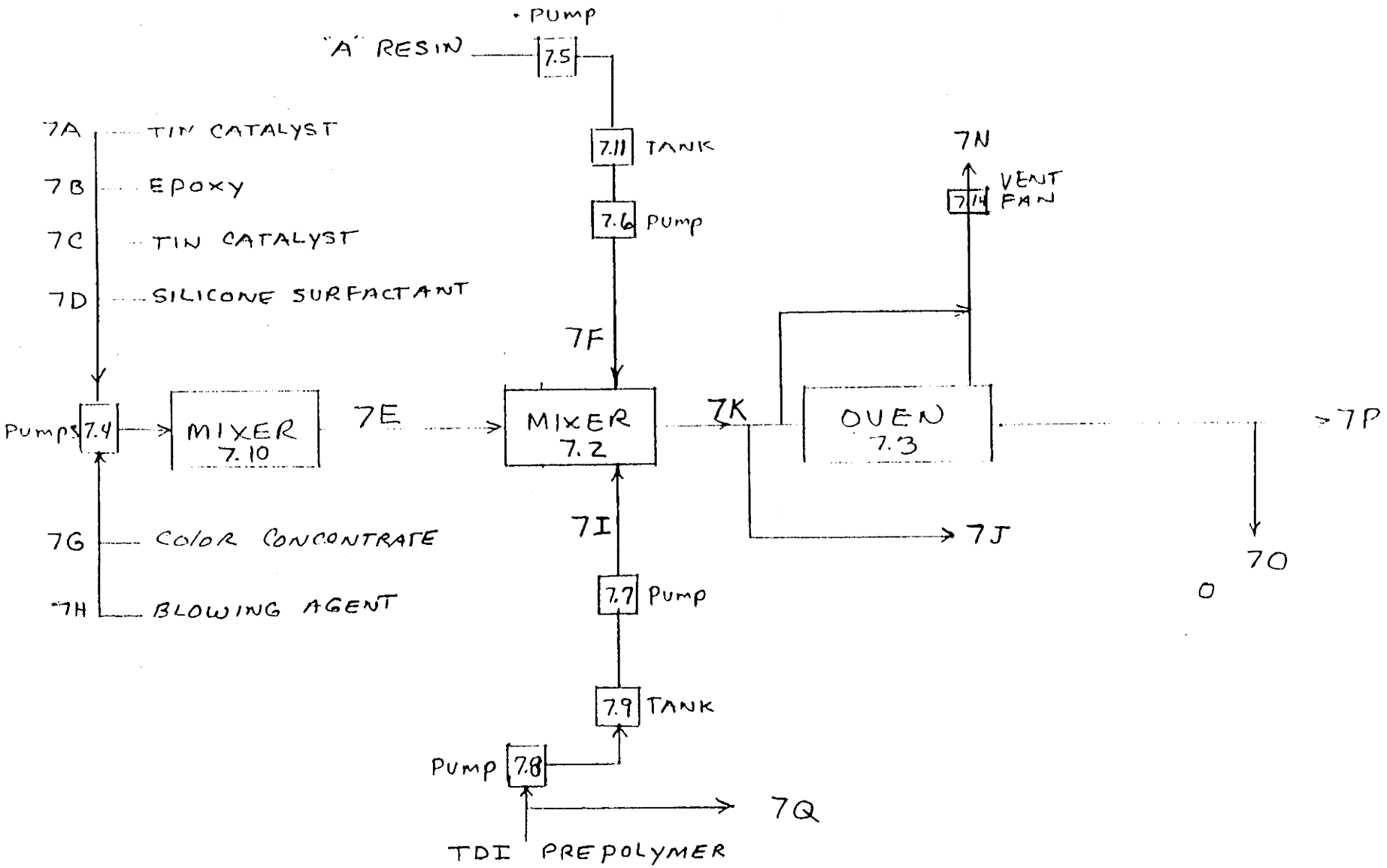
[X] Mark (X) this box if you attach a continuation sheet.

Batch TDI Polymerization

7.01



7.01



URETANE POLYMERIZATION PROCESS

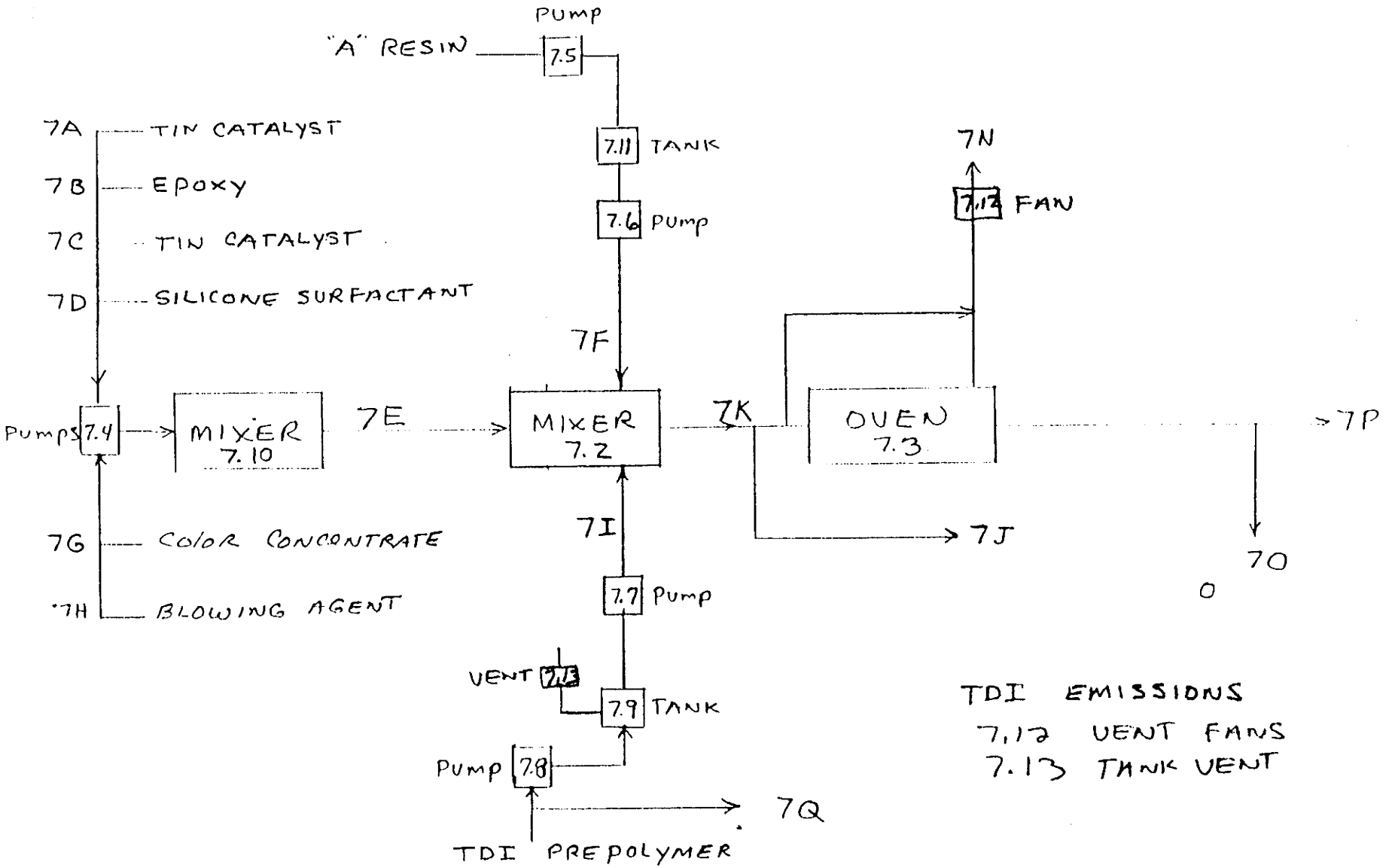
7.03 In accordance with the instructions, provide a process block flow diagram showing all process emission streams and emission points that contain the listed substance and which, if combined, would total at least 90 percent of all facility emissions if not treated before emission into the environment. If all such emissions are released from one process type, provide a process block flow diagram using the instructions for question 7.01. If all such emissions are released from more than one process type, provide a process block flow diagram showing each process type as a separate block.

CBI

[ ] Process type ..... Batch TDI Polymerization

[X] Mark (X) this box if you attach a continuation sheet.

7.03 7.03

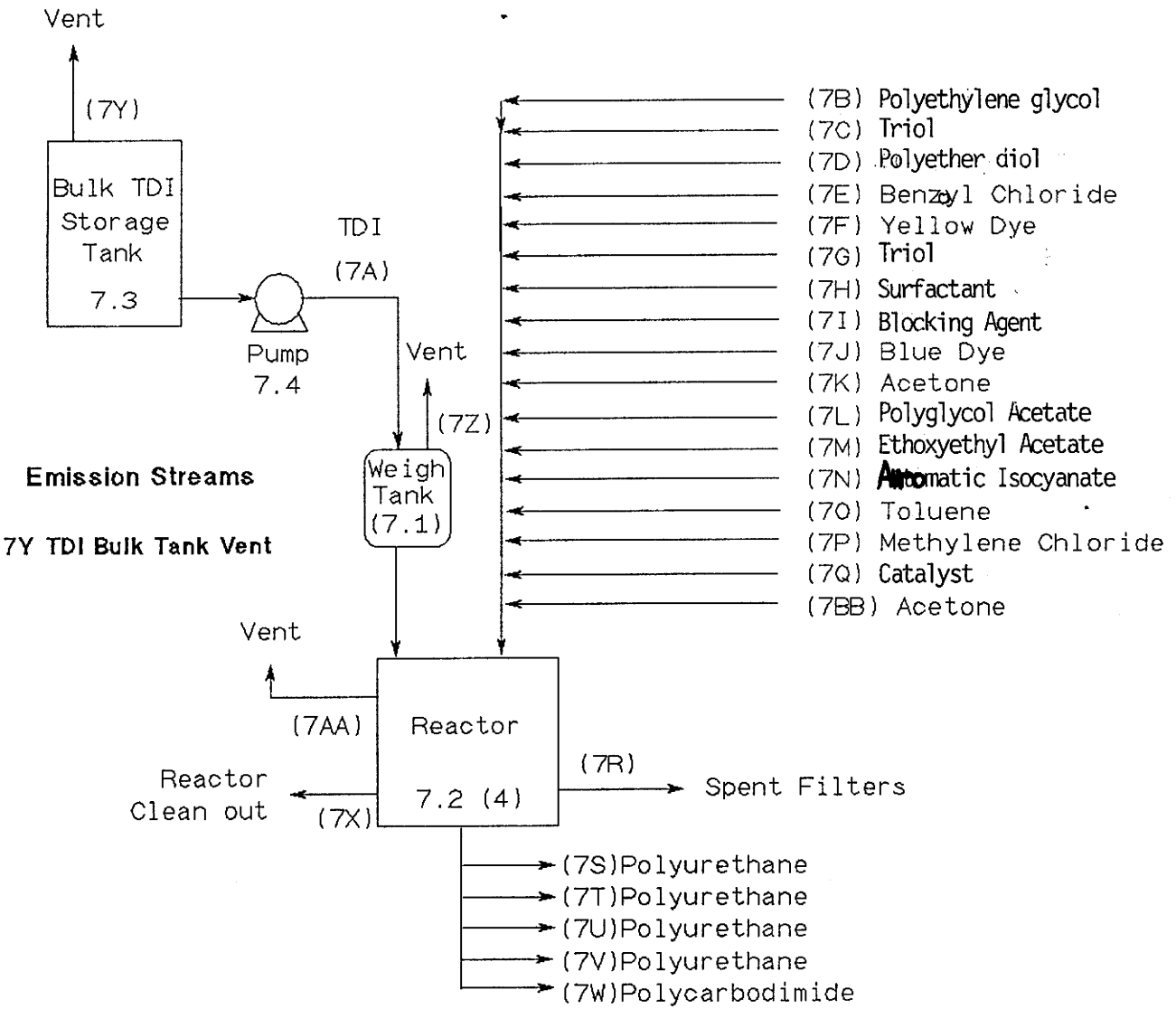


TDI EMISSIONS
7.12 VENT FANS
7.13 TANK VENT

CONTINUOUS URETHANE POLYMERIZATION PROCESS

Batch TDI Polymerization

7.03



Emission Streams

7Y TDI Bulk Tank Vent

7.04 Describe the typical equipment types for each unit operation identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization

Unit Operation ID Number	Typical Equipment Type	Operating Temperature Range (°C)	Operating Pressure Range (mm Hg)	Vessel Composition
7.1	Weigh Tank	ambient	atmospheric	stainless steel
7.2	Reactor	13-140	10-2500	stainless steel
7.3	Bulk Storage Tank	ambient	atmospheric	stainless steel
7.4	Pump	ambient	atmospheric	stainless steel

[X] Mark (X) this box if you attach a continuation sheet.

7.04 Describe the typical equipment types for each unit operation identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Unit Operation ID Number	Typical Equipment Type	Operating Temperature Range (°C)	Operating Pressure Range (mm Hg)	Vessel Composition
7.1	Mixer	ambient	760-2600	stainless steel
7.2	Mixer	ambient	760-2600	stainless steel
7.3	Oven	20-260	760	Aluminum + Steel
7.4-7.8	Pumps	ambient	1000-7800	stainless steel
7.9	Tank	ambient	760	stainless steel
7.11	Tank	ambient	760	stainless steel
7.12	Vent Fans	30°C - 150°C	760	steel

[ ] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization (1)

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7A	Toluene Diisocyanate	OL	58,607
7B	Polyethylene Glycol	SO	75,007
7C	Triol	SO	33,122
7D	Polyether Diol	SO	78,742
7E	Benzoyl Chloride	PL	56
7F	Yellow dye	SO	13.7
7G	Triol	SO	319
7H	Surfactant	OL	651

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[X] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization (2)

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7I	Blocking Agent	OL	5,943
7J	Blue Dye	SO	15.6
7K	Acetone	OL	33,127
7L	Polyglycol Acetate	OL	14,169
7M	Ethoxyethyl Acetate	OL	7,648
7N	Aromatic Isocyanate	OL	2.7
7O	Toluene	OL	73.6
7P	Methylene Chloride	OL	0.17

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[X] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization (3)

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7Q	Catalyst	OL	0.11
7R	Spent Filters	SO	358
7S	Polyurethane	OL	48,858
7T	Isocyanate Terminated Polyurethane	OL	130,239
7U	Isocyanate Terminated Polyurethane	OL	56,231
7V	Isocyanate Terminated Polyurethane	OL	79,665
7W	Polycarbodiimide	OL	161
7X	Acetone	OL	30,025

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[X] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization (4)

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7Y	TDI Bulk Tank Vent	GU	0.9
7Z	TDI Weigh Tank Vent	GU	0
7AA	Reactor Vent	GU	17.7
7BB	Acetone	OL	27,877

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[X] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7A	Stannous Octoate	OL	685
7B	Epoxy	OL	1,255
7C	Stannous Chloride - PPG	OL	6,691
7D	DC 200 Silicone	OL	406
7E	Pre Blend	OL	16,641
7F	Resin "A"	OL	213,031
7G	Color Concentrate	OL	6,559
7H	Polyol-Water	OL	1,045

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[X] Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Process Stream ID Code	Process Stream Description	Physical State[1]	Stream Flow (kg/yr)
7I	TDI Pre Polymer	OL	34,085
7K	Polymer	OL	263,757
7N	Vent	GU	86
7P	Polymer	SO	250,171
7J	Start Up Waste	OL, SO	1,000
7Q	Empty TDI Pre Polymer Drums	OL	129
7O	Off Spec Product	SO	12,500

[1]Use the following codes to designate the physical state for each process stream:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7A	Toluene diisocyanate	99.9 (A) (W)	NA	NA
7B	Polyethylene Glycol	100 (A) (W)	NA	NA
7C	Triol	100 (A) (W)	NA	NA
7D	Polyether Diol	100 (A) (W)	NA	NA
7E	Benzoyl Chloride	100 (A) (W)	NA	NA
7F	Yellow Dye	100 (A) (W)	NA	NA
7G	Triol	100 (A) (W)	NA	NA
7H	Surfactant	100 (A) (W)	NA	NA
7I	Blocking Agent	100 (A) (W)	NA	NA
7J	Blue dye	100 (A) (W)	NA	NA
7K	Acetone	100 (A) (W)	NA	NA
7L	Polyglycol Acetate	100 (A) (W)	NA	NA

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7M	2 Ethoxy ethyl acetate	100 (A) (W)	NA	NA
7N	Aromatic Isocyanate	100 (A) (W)	NA	NA
7O	Toluene	100 (A) (W)	NA	NA
7P	Methylene Chloride	100 (A) (W)	NA	NA
7Q	Catalyst	100 (A) (W)	NA	NA
7R	Polyurethane	82 (E) (W)	NA	NA
	Polyurethane Acetone	11.0 (E) (W)	NA	NA
	Blue dye	0.25 (E) (W)	NA	NA
	2 Ethoxy ethyl Acetate	4.5 (E) (W)	NA	NA
	Surfactant	0.4 (E) (W)	NA	NA
	Polyglycol Acetate	1.7 (E) (W)	NA	NA
	Yellow dye	0.08 (E) (W)	NA	NA

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

	a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
(cont)	7R	Polycarbodiimide	.007 (E) (W)	NA	NA
		Toluene	0.04 (E) (W)	NA	NA
		Toluene Diisocyanate	TRACE (E) (W)	NA	NA
	7S	Polyurethane	67-73 (A) (W)	NA	NA
		Polyglycol Acetate	27-33 (A) (W)	NA	NA
		Yellow dye	0.5 (A) (W)	NA	NA
		Toluene Diisocyanate	< 1.0 (A) (W)	NA	NA
	7T	Polyurethane	85 (A) (W)	NA	NA
		Polyurethane Acetone	14 (A) (W)	NA	NA
		Toluene Diisocyanate	< 1.0 (A) (W)	NA	NA
		Surfactant	< 1.0 (A) (W)	NA	NA

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7U	Polymethane	90 (A) (W)	NA	NA
	2 Ethoxy ethyl acetate	10 (A) (W)	NA	NA
	Toluene Diisocyanate	<1.0 (A) (W)	NA	NA
7V	Polyurethane	79 (A) (W)	NA	NA
	Acetone	21 (A) (W)	NA	NA
	Toluene Diisocyanate	<1.0 (A) (W)	NA	NA
	Blue dye	<1.0 (A) (W)	NA	NA
7W	Polycarbodiimide	13 (A) (W)	NA	NA
	Toluene	86 (A) (W)	NA	NA
	Methylene Chloride	<1.0 (A) (W)	NA	NA

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7X	Acetone	92.9 (E) (W)	UK	NA
	Polyurethane	6.6 (E) (W)		
	Blue dye	.018 (E) (W)		
	2 Ethoxy ethyl acetate	.32 (E) (W)		
	Surfactant	.03 (E) (W)		
	Polyglycol Acetate	.12 (E) (W)		
	Yellow dye	.006 (E) (W)		
	Polycarbodiimide	.0005 (E) (W)		
	Toluene	.003 (E) (W)		
7Y	TDI	100 (E) (W)	UK	NA

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7Z	Nitrogen	100 (E) (W)	UK	NA
7AA	Acetone	99 (E) (W)	UK	NA
	Ethoxyl ethyl acetate	1 (E) (W)		
7BB	Acetone	99 (A) (W)	UK	NA
	Water	1 (A) (W)		

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Continuous Urethane Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7A	Stannous Octoate	100%	UK	N/A
7B	Epoxy-ERL 4221	100%	UK	N/A
7C	Stannous Chloride	20%	UK	N/A
	Polyol	80%		

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Continuous Urethane Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7E	Stannous Octoate	4.1%	UK	N/A
	Epoxy ERL - 4221	7.5%		
	Stannous Chloride	40.2%		
	PPG 425 - Water	39.4%		
	DC 200	2.4%		
	Color Concentrate	6.4%		
7F	PPG - 2025	27.8%	UK	N/A
	LHT - 112	23.8%		
	HEX Calcium	0.3%		
	Ionol	0.3%		
	Thixcin - E	1.2%		
	HW Clay	46.6%		

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Continuous Urethane Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7D	DC 200	100%	UK	N/A
7G	Carbon Black		UK	N/A
	PPG 2025			
7H	Water	80%	UK	N/A
	PPG 425	20%		

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Continuous Urethane Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7I	Pre Polymer	55%	UK	N/A
	TDI	45%		
7K	TDI	6% *	UK	N/A
	Other Listed	94%		
7J	Urethane Polymer	100%	UK	N?A

7.06 continued below

* Max concentration - Goes to 0% as the reaction goes to completion.

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Continuous Urethane Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7N	TDI	0.167 ppm	UK	N/A
7P	Urethane Polymer	100%	UK	N/A
7O	Urethane Polymer	100%	UK	N/A

7.06 continued below

[X] Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the CBI instructions for further explanation and an example.)

[ ] Process type ..... Continuous Urethane Polymerization

a. Process Stream ID Code	b. Known Compounds[1]	c. Concentrations[2,3] (% or ppm)	d. Other Expected Compounds	e. Estimated Concentrations (% or ppm)
7Q	Pre Polymer	55%	UK	N/A
	TDI	45%		

7.06 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

7.06 (continued)

[1]For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column b. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.)

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1	Not Applicable	Not Applicable
2		
3		
4		
5		

[2]Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

[3]Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

[ ] Mark (X) this box if you attach a continuation sheet.

PART A RESIDUAL TREATMENT PROCESS DESCRIPTION

8.01 In accordance with the instructions, provide a residual treatment block flow diagram which describes the treatment process used for residuals identified in question 7.01.

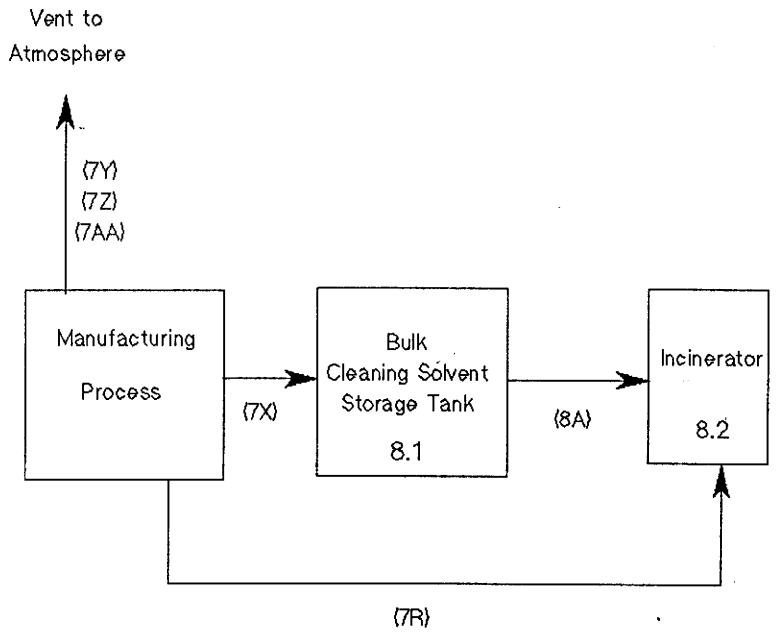
CBI

[ ] Process type ..... Batch TDI Polymerization

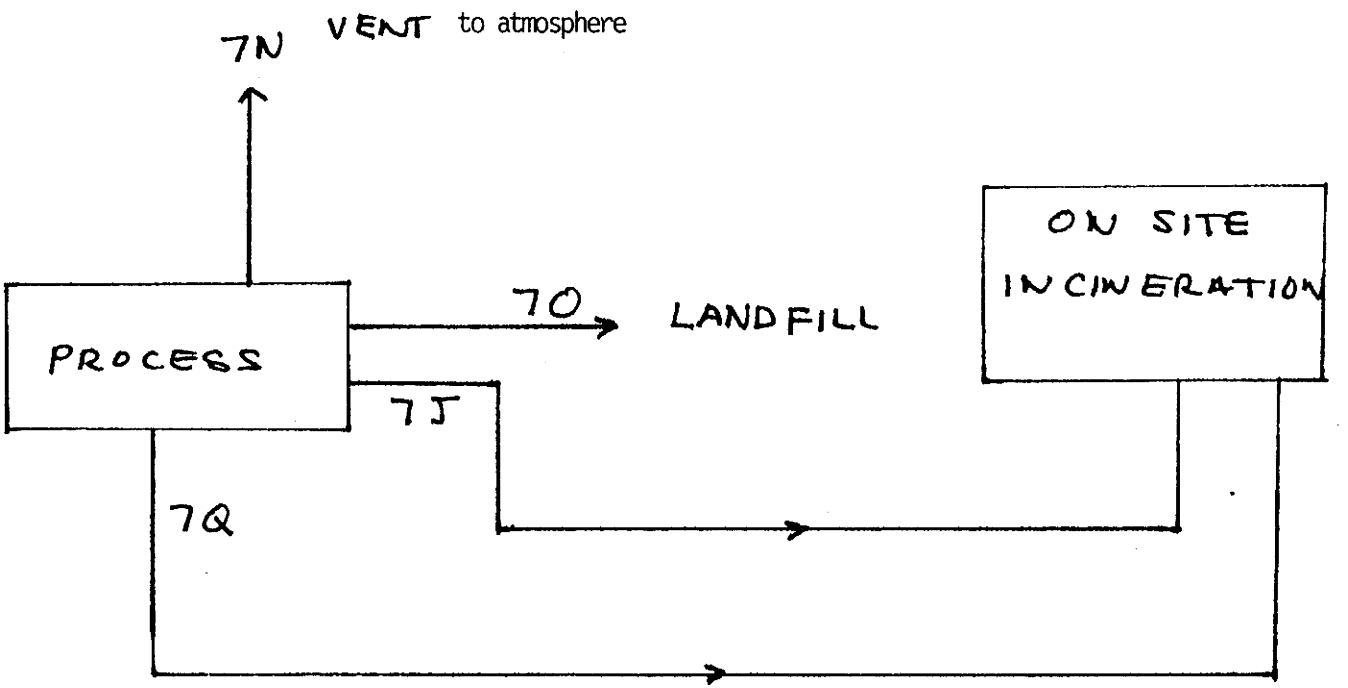
[X] Mark (X) this box if you attach a continuation sheet.

Batch TDI Polymerization

8.01



8.01



URETHANE POLYMERIZATION PROCESS

TPTC RIA 6-2-89

PART B RESIDUAL GENERATION AND CHARACTERIZATION

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process
CBI type. (Refer to the instructions for further explanation and an example.)

[ ] Process type ..... Batch TDI Polymerization

a. Stream ID Code	b. Type of Hazardous Waste[1]	c. Physical State of Residual[2]	d. Known Compounds[3]	e. Concentrations (% or ppm)[4,5,6]	f. Other Expected Compounds	g. Estimated Concentrations (% or ppm)
7X	I	OL	Acetone	92.9 (E) (W)	UK	N/A
			Polyurethane	6.6 (E) (W)		
			Blue dye	0.18 (E) (W)		
			2 Ethoxy ethyl acetate	.32 (E) (W)		
			Surfactant	.03 (E) (W)		
			Polyglycol Acetate	.12 (E) (W)		
			Yellow dye	.006 (E) (W)		
			Polycarbodiimide	.0005 (E) (W)		
			Toluene	.003 (E) (W)		
7R	I	SO	Polyurethane	82 (E) (W)	UK	N/A
			Polyurethane Acetone	11 (E) (W)		
			Blue dye	0.25 (E) (W)		
			2 ethoxy ethyl acetate	4.5 (E) (W)		

8.05 continued below

[X] Mark (X) this box if you attach a continuation sheet.

PART B RESIDUAL GENERATION AND CHARACTERIZATION

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... Batch TDI Polymerization

	a. Stream ID Code	b. Type of Hazardous Waste[1]	c. Physical State of Residual[2]	d. Known Compounds[3]	e. Concentrations (% or ppm)[4,5,6]	f. Other Expected Compounds	g. Estimated Concentrations (% or ppm)
(cont)	7R	I	SO	Surfactant	0.4 (E) (W)	UK	N/A
				Polyglycol Acetate	1.7 (E) (W)		
				Polycarbodiimide	.007 (E) (W)		
				Toluene	.04 (E) (W)		
				Yellow dye	.08 (E) (W)		
				Toluene Diisocyanate	TRACE (E) (W)		
	7Y	T	GU	TDI	100 (E) (W)	UK	N/A
	7Z	N/A	GU	Nitrogen	100 (E) (W)	UK	N/A
	7AA	I	GU	Acetone	99 (E)(W)	UK	N/A
				Ethoxyethyl acetate	1 (E)(W)	UK	N/A
	8A	I	OL	Mixed cleaning solvents	100%	UK	N/A

8.05 continued below

[X] Mark (X) this box if you attach a continuation sheet.

PART B RESIDUAL GENERATION AND CHARACTERIZATION

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... Continuous Urethane Polymerization

a. Stream ID Code	b. Type of Hazardous Waste[1]	c. Physical State of Residual[2]	d. Known Compounds[3]	e. Concentrations (% or ppm)[4,5,6]	f. Other Expected Compounds	g. Estimated Concentrations (% or ppm)
7Q	R	OL	TDI	45 (E) (W)	Pre Polymer	45
7J		OL	Polyol	55 (E) (W)	UK	N/A
			Clay	45 (E) (W)		
7N		GU	TDI	.167 ppm (E) (W)	None	N/A
7O		SO	(Reacted) Final Product	100 (E)(W)	UK	N/A

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[1]Use the following codes to designate the type of hazardous waste:

I = Ignitable
C = Corrosive
R = Reactive
E = EP toxic
T = Toxic
H = Acutely hazardous

[2]Use the following codes to designate the physical state of the residual:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

8.05 continued below

[ ] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[3]For each additive package introduced into a process stream, specify the compounds that are present in each additive package, and the concentration of each component. Assign an additive package number to each additive package and list this number in column d. (Refer to the instructions for further explanation and an example. Refer to the glossary for the definition of additive package.)

Additive Package Number	Components of Additive Package	Concentrations (% or ppm)
1	Not Applicable	
2		
3		
4		
5		

[4]Use the following codes to designate how the concentration was determined:

A = Analytical result
E = Engineering judgement/calculation

8.05 continued below

[X] Mark (X) this box if you attach a continuation sheet.

8.05 (continued)

[5]Use the following codes to designate how the concentration was measured:

V = Volume
W = Weight

[6]Specify the analytical test methods used and their detection limits in the table below. Assign a code to each test method used and list those codes in column e.

Code	Method	Detection Limit (± ug/l)
1	N/A	N/A
2		
3		
4		
5		
6		

[ ] Mark (X) this box if you attach a continuation sheet.

8.06 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... Batch TDI Polymerization

a. Stream ID Code	b. Waste Description Code[1]	c. Management Method Code[2]	d. Residual Quantities (kg/yr)	e. Management of Residual (%) On-Site	e. Management of Residual (%) Off-Site	f. Costs for Off-Site Management (per kg)	g. Changes in Management Methods
7X	A01	2 ST (S)	30,025	100	NA	NA	None
7R	A08	3I	358	100	NA	NA	None
7Y	B91	M5	.9	100	NA	NA	None
7Z	B57	M5	NA	100	NA	NA	None
7AA	B91	M5	17.7	100	NA	NA	None
8A	A01	3I (S)	1,363,636	100	NA	NA	None

[1]Use the codes provided in Exhibit 8-1 to designate the waste descriptions

[2]Use the codes provided in Exhibit 8-2 to designate the management methods

[X] Mark (X) this box if you attach a continuation sheet.

8.06 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

[ ] Process type ..... Continuous Urethane Polymerization

a. Stream ID Code	b. Waste Description Code[1]	c. Management Method Code[2]	d. Residual Quantities (kg/yr)	e. Management of Residual (%) On-Site	e. Management of Residual (%) Off-Site	f. Costs for Off-Site Management (per kg)	g. Changes in Management Methods
7N	B91	M5	86	100%		N/A	N/A
7J	A08	3I	1000	100%		N/A	N/A
7Q	A09	3I	129	100%		N/A	N/A
7O	A08	1D	12,500	100%		N/A	N/A

[1]Use the codes provided in Exhibit 8-1 to designate the waste descriptions

[2]Use the codes provided in Exhibit 8-2 to designate the management methods

[ ] Mark (X) this box if you attach a continuation sheet.

8.22 Describe the combustion chamber design parameters for each of the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

CBI

[ ]

Incinerator	Combustion Chamber Temperature (°C)		Location of Temperature Monitor		Residence Time In Combustion Chamber (seconds)	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
1						
2						
3						

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No 2

8.23 Complete the following table for the three largest (by capacity) incinerators that are used on-site to burn the residuals identified in your process block or residual treatment block flow diagram(s).

CBI

[ ]

Incinerator	Air Pollution Control Device[1]	Types of Emissions Data Available
1	E (Wet), S (Pack tower,	metals, organics, inorganics,
2	catenary grid)	halogens, particulates
3		

Indicate if Office of Solid Waste survey has been submitted in lieu of response by circling the appropriate response.

Yes 1

No ..... (2)

[1]Use the following codes to designate the air pollution control device:

S = Scrubber (include type of scrubber in parenthesis)
E = Electrostatic precipitator
O = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 9 WORKER EXPOSURE

General Instructions:

Questions 9.03-9.25 apply only to those processes and workers involved in manufacturing or processing the listed substance. Do not include workers involved in residual waste treatment unless they are involved in this treatment process on a regular basis (i.e., exclude maintenance workers, construction workers, etc.).

[ ] Mark (X) this box if you attach a continuation sheet.

PART A EMPLOYMENT AND POTENTIAL EXPOSURE PROFILE

9.01 Mark (X) the appropriate column to indicate whether your company maintains records on the following data elements for hourly and salaried workers. Specify for each data element the year in which you began maintaining records and the number of years the CBI records for that data element are maintained. (Refer to the instructions for further explanation and an example.)

[ ]

Data Element	Data are Maintained for: Hourly Workers	Salaried Workers	Year in Which Data Collection Began	Number of Years Records Are Maintained
Date of hire	X	X	1975	indefinitely
Age at hire	X	X	1975	indefinitely
Work history of individual before employment at your facility	NA	NA	NA	NA
Sex	X	X	1975	indefinitely
Race	X	X	1975	indefinitely
Job titles	X	X	1975	indefinitely
Start date for each job title	X	X	1975	indefinitely
End date for each job title	X	X	1975	indefinitely
Work area industrial hygiene monitoring data *	NA	NA	NA	NA
Personal employee monitoring data	NA	NA	NA	NA
Employee medical history	X	X	about 1960	indefinitely
Employee smoking history	NA	NA	NA	NA
Accident history	X	X	about 1960	Indefinitely
Retirement date	X	X	1932	indefinitely
Termination date	X	X	1932	indefinitely
Vital status of retirees	X	X	1932	indefinitely
Cause of death data	X	X	about 1960	indefinitely

[ ] Mark (X) this box if you attach a continuation sheet.

* 3M does I.H. monitering of work areas, but data is not maintained in worker files. See Question 9.08.

9.02 In accordance with the instructions, complete the following table for each activity in which you engage.

CBI

[ ]

a. Activity	b. Process Category	c. Yearly Quantity (kg)	d. Total Workers	e. Total Worker-Hours
Manufacture of the listed substance	Enclosed	N/A	N/A	N/A
	Controlled Release	N/A	N/A	N/A
	Open	N/A	N/A	N/A
On-site use as reactant	Enclosed	58,607	20	1,189
	Controlled Release	15,396	8	8000
	Open	N/A	N/A	N/A
On-site use as nonreactant	Enclosed	N/A	N/A	N/A
	Controlled Release	N/A	N/A	N/A
	Open	N/A	N/A	N/A
On-site preparation of products	Enclosed	N/A	N/A	N/A
	Controlled Release	N/A	N/A	N/A
	Open	N/A	N/A	N/A

[ ] Mark (X) this box if you attach a continuation sheet.

9.03 **Provide a descriptive job title for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance.**

CBI

[ ]

Labor Category	Descriptive Job Title
A	Chemical Reactor Operator
B	Shift Supervisor
C	Quality Control Laboratory Technician
D	Technical Support
E	Line Operator
F	
G	
H	
I	
J	

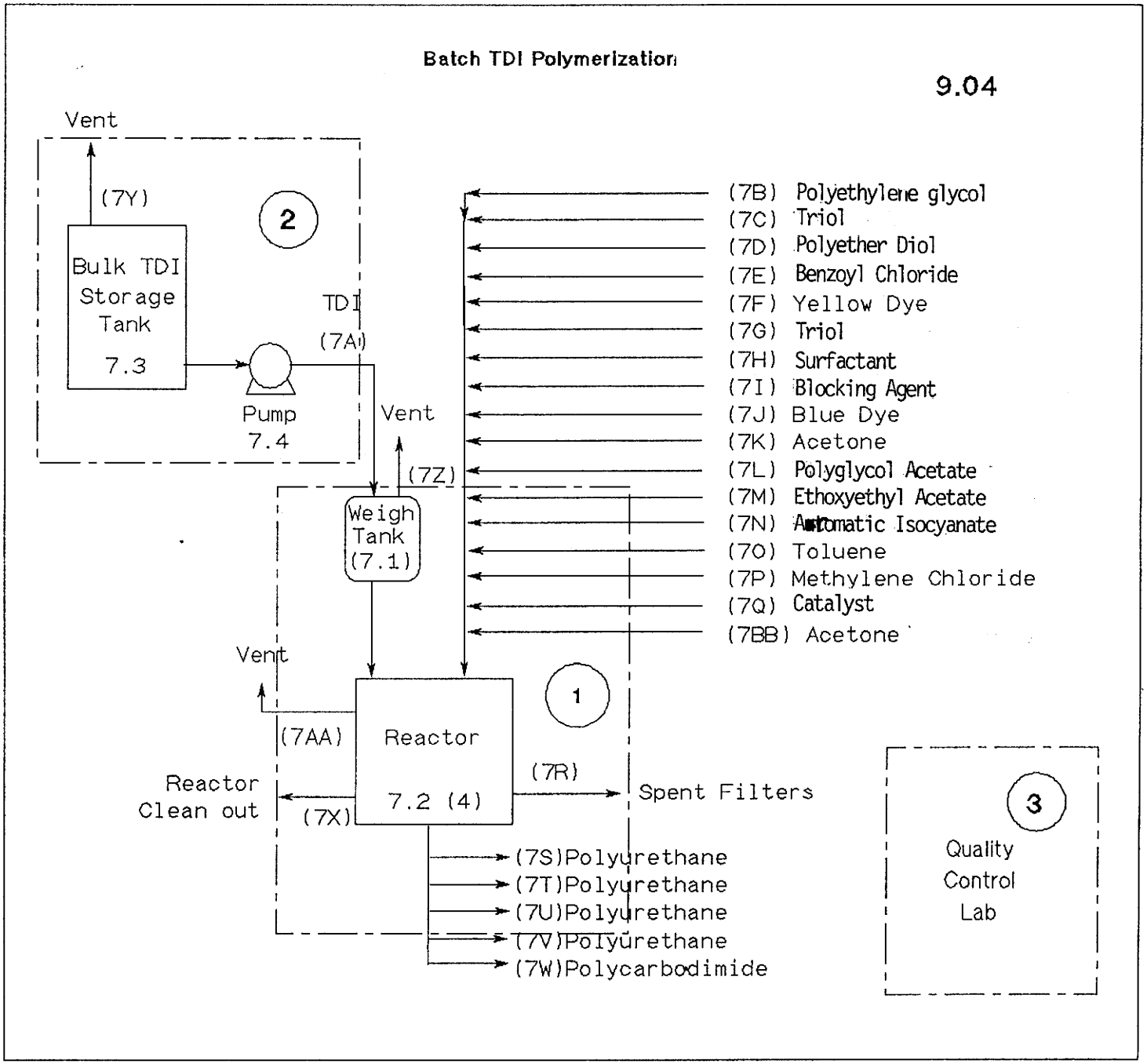
[ ] **Mark (X) this box if you attach a continuation sheet.**

9.04 **In accordance with the instructions, provide your process block flow diagram(s) and indicate associated work areas.**

CBI

[ ] **Process type .....** Batch TDI Polymerization

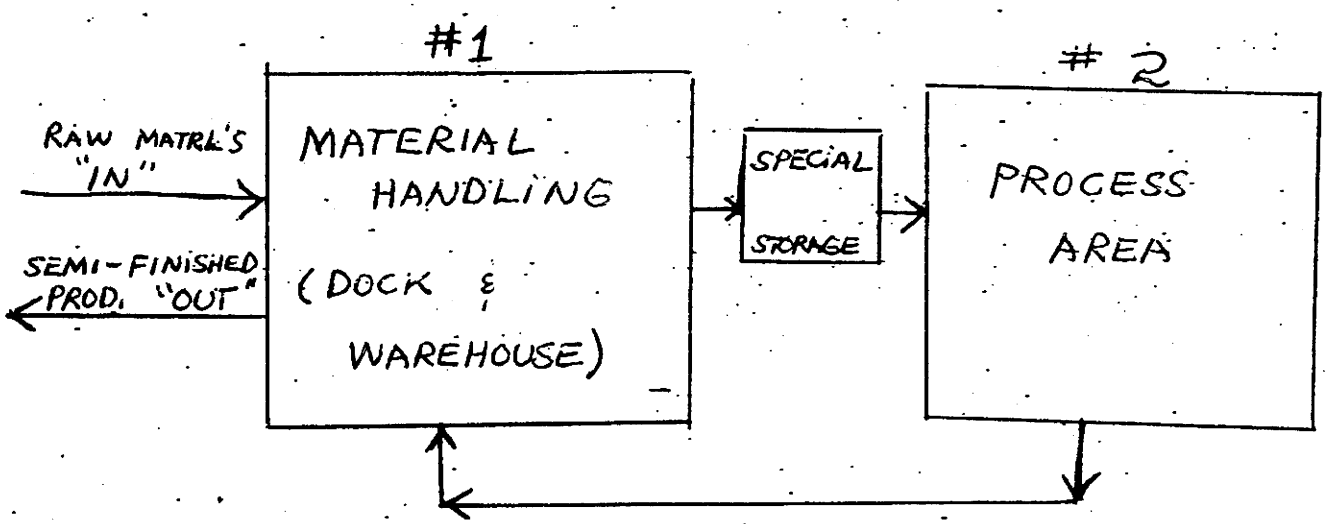
[X] **Mark (X) this box if you attach a continuation sheet.**


Batch TDI Polymerization
9.04
Vent
(7Y)
2
Bulk TDI Storage Tank 7.3
TDI (7A)
Pump 7.4
Vent
(7Z)
Weigh Tank (7.1)
(7B) Polyethylene glycol
(7C) Triol
(7D) Polyether Diol
(7E) Benzoyl Chloride
(7F) Yellow Dye
(7G) Triol
(7H) Surfactant
(7I) Blocking Agent
(7J) Blue Dye
(7K) Acetone
(7L) Polyglycol Acetate
(7M) Ethoxyethyl Acetate
(7N) Aromatic Isocyanate
(7O) Toluene
(7P) Methylene Chloride
(7Q) Catalyst
(7BB) Acetone
Vent
(7AA)
Reactor 7.2 (4)
1
(7R)
Spent Filters
Reactor Clean out
(7X)
(7S)Polyurethane
(7T)Polyurethane
(7U)Polyurethane
(7V)Polyurethane
(7W)Polycarbodimide
3
Quality Control Lab

9.04 In accordance with the instructions, provide your process block flow diagram(s) and indicate associated work areas.

CBI

[ ] Process type ..... Continuous Urethane Polymerization



[ ] Mark (X) this box if you attach a continuation sheet.

9.05 **Describe the various work area(s) shown in question 9.04 that encompass workers who may potentially come in contact with or be exposed to the listed substance. Add any additional areas not shown in the process block flow diagram in question 7.01 or 7.02. Photocopy this question and complete it separately for each process type.**

CBI

[ ] **Process type .....** Batch TDI Polymerization

Work Area ID	Description of Work Areas and Worker Activities
1	Reactor area (Charge raw materials, monitor reaction conditions, sample, drain and package product, pre-and post-cleanups).
2	TDI Bulk Storage (transfer TDI from cylinders to the bulk storage tank. Transfer TDI from bulk storage to the weigh tank).
3	Quality Control Lab (test samples for compliance to specifications).

[X] **Mark (X) this box if you attach a continuation sheet.**

9.05 Describe the various work area(s) shown in question 9.04 that encompass workers who may potentially come in contact with or be exposed to the listed substance. Add any additional areas not shown in the process block flow diagram in question 7.01 or 7.02. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work Area ID	Description of Work Areas and Worker Activities
1	Material Handling (Dock - Warehouse)
2	Process area (Product make)
3	
4	
5	
6	
7	
8	
9	
10	

[ ] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 1 (Reactor)

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
A	3	Direct skin contact	OL	B	52
A	3	Inhalation	GU	B	52
B	3	Inhalation	OL	B	52

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[X] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question
CBI and complete it separately for each process type and work area.

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 2 (TDI Bulk Tank)

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
A	3	Direct skin contact	OL	D	12
A	3	Inhalation	GU	D	12
B	3	Inhalation	GU	D	12

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[X] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 3 (QC lab)

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
C	12	Direct skin contact	OL	B	52
C	12	Inhalation	GU	B	52

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[X] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Process Area (2)

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
D	2	Closed system	OL/GU	0	0
E	8	Closed system	OL/GU	0	0

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[X] Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Material Handling (1)

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance[1]	Average Length of Exposure Per Day[2]	Number of Days per Year Exposed
D	0	Sealed drum	AL	0	0
E	10	Sealed drim	AL	0	0

[1]Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
GU = Gas (uncondensible at ambient temperature and pressure; includes fumes, vapors, etc.)
SO = Solid
SY = Sludge or slurry
AL = Aqueous liquid
OL = Organic liquid
IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

[2]Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
B = Greater than 15 minutes, but not exceeding 1 hour
C = Greater than one hour, but not exceeding 2 hours
D = Greater than 2 hours, but not exceeding 4 hours
E = Greater than 4 hours, but not exceeding 8 hours
F = Greater than 8 hours

[ ] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 1 Reactor

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
A	.001 ppm	NA
B	.001 ppm	NA

[X] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 2 TDI Bulk Tank

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
A	< .0003 ppm	NA
B	< .0003 ppm	NA

[X] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 3 QC Lab

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
C	0.002 ppm	NA

[X] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Material Handling

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
D	0	0
E	0	0

[X] Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Process Area

Labor Category	8-hour TWA Exposure Level (ppm, mg/m^3, other-specify)	15-Minute Peak Exposure Level (ppm, mg/m^3, other-specify)
D	0	0
E	0	0

[ ] Mark (X) this box if you attach a continuation sheet.

PART B WORK PLACE MONITORING PROGRAM

9.08 If you monitor worker exposure to the listed substance, complete the following table.

CBI Process type: TDi Batch Polymerization

[ ]

Sample/Test	Work Area ID	Testing Frequency (per year)	Number of Samples (per test)	Who Samples[1]	Analyzed In-House (Y/N)	Number of Years Records Maintained
Personal breathing zone	1,2,3	1	1	A	Y	5 years
General work area (air)	1,2,3	1	1	A	Y	5 years
Wipe samples	N/A	N/A	N/A	N/A	N/A	N/A
Adhesive patches	N/A	N/A	N/A	N/A	N/A	N/A
Blood samples	N/A	N/A	N/A	N/A	N/A	N/A
Urine samples	N/A	N/A	N/A	N/A	N/A	N/A
Respiratory samples	N/A	N/A	N/A	N/A	N/A	N/A
Allergy tests	N/A	N/A	N/A	N/A	N/A	N/A
Other (specify) N/A						
Other (specify) N/A						
Other (specify) N/A						

[1]Use the following codes to designate who takes the monitoring samples:

A = Plant industrial hygienist
B = Insurance carrier
C = OSHA consultant
D = Other (specify) _____

[X] Mark (X) this box if you attach a continuation sheet.

PART B WORK PLACE MONITORING PROGRAM

9.08 If you monitor worker exposure to the listed substance, complete the following table.

CBI Process type: Continuous Urethane Polymerization

[ ]

Sample/Test	Work Area ID	Testing Frequency (per year)	Number of Samples (per test)	Who Samples[1]	Analyzed In-House (Y/N)	Number of Years Records Maintained
Personal breathing zone						
General work area (air)	1,2	continuous	every 2 min	D (machine)	Y	< 1
Wipe samples						
Adhesive patches						
Blood samples						
Urine samples						
Respiratory samples						
Allergy tests						
Other (specify)						
Other (specify)						
Other (specify)						

[1]Use the following codes to designate who takes the monitoring samples:

A = Plant industrial hygienist
B = Insurance carrier
C = OSHA consultant
D = Other (specify) Monitor unit

[ ] Mark (X) this box if you attach a continuation sheet.

9.09 CBI For each sample type identified in question 9.08, describe the type of sampling and analytical methodology used for each type of sample.

[ ] Sample Type	Sampling and Analytical Methodology
Personal breathing zone	Impinger with 0.4N HCl and 0.4 N acetic acid solution and Colorimetric.
General area	Impinger with 0.4N HCl and 0.4N acetic acid salt - Colorimetric.
	Impinger with .0001 m 4-nitrobenzyl-n-propylamine in Toluene; HPLC .
Air	Automatic air sample filtered through chemically treated paper

9.10 CBI If you conduct personal and/or ambient air monitoring for the listed substance, specify the following information for each equipment type used.

[ ] Equipment Type[1]	Detection Limit[2]	Manufacturer	Averaging Time (hr)	Model Number
E	0.007A	Gilian	1/2 hr.	H75 113A
E	.001 A	MDA x 2	1/30 hr.	7005 & 7100

[1]Use the following codes to designate personal air monitoring equipment types:

A = Passive dosimeter
B = Detector tube
C = Charcoal filtration tube with pump
D = Other (specify) _____

Use the following codes to designate ambient air monitoring equipment types:

E = Stationary monitors located within work area
F = Stationary monitors located within facility
G = Stationary monitors located at plant boundary
H = Mobile monitoring equipment (specify) _____
I = Other (specify) _____

[2]Use the following codes to designate detection limit units:

A = ppm
B = Fibers/cubic centimeter (f/cc)
C = Micrograms/cubic meter (μ/m^3)

[ ] Mark (X) this box if you attach a continuation sheet.

9.11 If you conduct routine medical tests for monitoring the health effects of exposure to the listed substance, specify the type and frequency of the tests.

CBI

[ ]	Test Description	Frequency (weekly, monthly, yearly, etc.)
	N/A	N/A

[ ] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 1 Reactor

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	Y	1955	N	NA
General dilution	Y	1955	N	NA
Other (specify)				
Vessel emission controls	Y	1955		NA
Mechanical loading or packaging equipment	Y	1972	N	NA
Other (specify)				
				NA

[X] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 2 (TDI Bulk Tank)

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	Y	1955	N	NA
General dilution	Y	1955	N	NA
Other (specify)				
_____				
Vessel emission controls				
Mechanical loading or packaging equipment	Y	1972	N	NA
Other (specify)				
_____				

[X] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 3 QC Lab

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	Y	1968	N	
General dilution	Y	1968	N	
Other (specify)				
Vessel emission controls	NA			
Mechanical loading or packaging equipment	NA			
Other (specify)				

[X] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... (Dock - Warehouse)

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	N			
General dilution	Y	1970	Y	1987
Other (specify)				
Education	Y	1987	N	
Vessel emission controls	N			
Mechanical loading or packaging equipment	N			
Other (specify)				
Access to spill kit	N	1987	Y	1989

[X] Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Process Area

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
Ventilation:				
Local exhaust	Y	1987	N	
General dilution	Y	1987	N	
Other (specify)				
Education - MSDS	Y	1982	Y	every year
Vessel emission controls	N			
Mechanical loading or packaging equipment	Y	1978	Y	1987
Other (specify)				
Access to spill kit	Y (practice only)	1987	Y	1989

[ ] Mark (X) this box if you attach a continuation sheet.

9.13 Describe all equipment or process modifications you have made within the 3 years prior to the reporting year that have resulted in a reduction of worker exposure to the listed substance. For each equipment or process modification described, state the percentage reduction in exposure that resulted. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area 1,2,3

Equipment or Process Modification	Reduction in Worker Exposure Per Year (%)
N/A	N/A

[X] Mark (X) this box if you attach a continuation sheet.

9.13 Describe all equipment or process modifications you have made within the 3 years prior to the reporting year that have resulted in a reduction of worker exposure to the listed substance. For each equipment or process modification described, state the percentage reduction in exposure that resulted. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Material Handling

Equipment or Process Modification	Reduction in Worker Exposure Per Year (%)
Special, self-contained, segregated, ventilated storage room	80%
for drum stock. Room equiped with closed-end floor holding pot	
in case of spill.	

[X] Mark (X) this box if you attach a continuation sheet.

9.13 Describe all equipment or process modifications you have made within the 3 years prior to the reporting year that have resulted in a reduction of worker exposure to the listed substance. For each equipment or process modification described, state the percentage reduction in exposure that resulted. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Process Area

Equipment or Process Modification	Reduction in Worker Exposure Per Year (%)
Completely rebuilt holding pot and transfer pump/meter pump system	95%
into a virtually closed system.	

[ ] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 1 Reactor

Equipment Types	Wear or Use (Y/N)
Respirators	Y
Safety goggles/glasses	Y
Face shields	N
Coveralls	Y
Bib aprons	N
Chemical-resistant gloves	Y
Other (specify)	

[X] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 2 (TDI Tank)

Equipment Types	Wear or Use (Y/N)
Respirators	Y
Safety goggles/glasses	Y
Face shields	N
Coveralls	Y
Bib aprons	N
Chemical-resistant gloves	Y
Other (specify)	

[X] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Batch TDI Polymerization

Work area ..... 3 QC Lab

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	Y
Face shields	N
Coveralls	N
Bib aprons	Y
Chemical-resistant gloves	Y
Other (specify)	

[X] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Material Handling ..... (Dock - Warehouse)

Equipment Types	Wear or Use (Y/N)
Respirators	N
Safety goggles/glasses	Y
Face shields	N
Coveralls	N
Bib aprons	N
Chemical-resistant gloves	N
Other (specify)	
_____	_____
_____	_____

[X] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Work area ..... Process Area

Equipment Types	Wear or Use (Y/N)	
Respirators	Y	- if need i.e. spill
Safety goggles/glasses	Y	- daily
Face shields	Y	- if needed
Coveralls	Y	- daily
Bib aprons	Y	- if needed; clean up
Chemical-resistant gloves	Y	- if needed
Other (specify)		
Fresh air supply hoods	Y	- if needed - spill or clean up

[ ] Mark (X) this box if you attach a continuation sheet.

9.15 If workers use respirators when working with the listed substance, specify for each process type, the work areas where the respirators are used, the type of respirators used, the average usage, whether or not the respirators were fit tested, and the type and frequency of the fit tests. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch Polymerization

Work Area	Respirator Type	Average Usage[1]	Fit Tested (Y/N)	Type of Fit Test[2]	Frequency of Fit Tests (per year)
1	Full face airline respirator	C	Y	QL	1
2	full face airline respirator	C	Y	QL	1

[1]Use the following codes to designate average usage:

A = Daily
B = Weekly
C = Monthly
D = Once a year
E = Other (specify) _____

[2]Use the following codes to designate the type of fit test:

QL = Qualitative
QT = Quantitative

[X] Mark (X) this box if you attach a continuation sheet.

9.15 If workers use respirators when working with the listed substance, specify for each process type, the work areas where the respirators are used, the type of respirators used, the average usage, whether or not the respirators were fit tested, and the type and frequency of the fit tests. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Polymerization

Work Area	Respirator Type	Average Usage[1]	Fit Tested (Y/N)	Type of Fit Test[2]	Frequency of Fit Tests (per year)
2	3M 8710 dust-mist	E	Y	QL	once
2	3M 8725 vapor	E	Y	QL	once
2	3M 8712 organic vapor	E	Y	QL	once

[1]Use the following codes to designate average usage:

A = Daily
B = Weekly
C = Monthly
D = Once a year
E = Other (specify) as required for spill training and fit tests

[2]Use the following codes to designate the type of fit test:

QL = Qualitative
QT = Quantitative

[ ] Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

[ ]

Process type ..... Batch TDI Polymerization

Work area ..... 1,2 and 3

Limited access, changing rooms and laundering service, respirator protection, training programs, safety information and MSDS included in operating standard, periodic exposure monitoring, safety meetings.

9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type ..... Batch TDI Polymerization

Work area ..... 1,2 and 3

Housekeeping Tasks	Less Than Once Per Day	1-2 Times Per Day	3-4 Times Per Day	More Than 4 Times Per Day
Sweeping	X			
Vacuuming	X			
Water flushing of floors	X			
Other (specify)				
Immediate response to spills or leaks.				

Very few spills or leaks occur because of engineering controls. If a spill does occur, it is cleaned up with a special TDI decontamination solution (50% ethanol, 27% water, 23% Ammonium Hydrixide). The TDI reacts with the solution to form a solid. This solid product is then disposed of by incineration.

[X] Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this CBI question and complete it separately for each process type and work area.

[ ]

Process type ..... Continuous Urethane Polymerization

Work area ..... Process Area

Restricted entrance, MSDS training, protective outerware, warning signs, machine and pump knowledge, automatic air sample monitoring, spill and clean-up procedure practice, proper disposal information, and chemistry.

9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type ..... Urethane Polymerization

Work area ..... Process Area

Housekeeping Tasks	Less Than Once Per Day	1-2 Times Per Day	3-4 Times Per Day	More Than 4 Times Per Day
Sweeping	X			
Vacuuming	X			
Water flushing of floors	X			
Other (specify) Solvent clean	X			

[X] Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this CBI question and complete it separately for each process type and work area.

[ ]

Process type ..... Continuous Urethane Polymerization

Work area ..... Material Handling (Dock - Warehouse)

Warehouse personnel were gathered together for an informational meeting - with MSDS in hand. This they should know in case of a leaker or "speared" drum arrives on dock. What to do --who to contact.

9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type ..... Urethane Polymerization

Work area ..... Material Handling (Dock - Warehouse)

Housekeeping Tasks	Less Than Once Per Day	1-2 Times Per Day	3-4 Times Per Day	More Than 4 Times Per Day
Sweeping	X			
Vacuuming	never			
Water flushing of floors	once/week			
Other (specify) Solvent clean	X			

[ ] Mark (X) this box if you attach a continuation sheet.

9.21 Do you have a written medical action plan for responding to routine or emergency exposure to the listed substance?

Routine exposure

Yes 1

No 2

Emergency exposure

Yes 1

No 2

If yes, where are copies of the plan maintained?

Routine exposure: _____

Emergency exposure: _____

9.22 Do you have a written leak and spill cleanup plan that addresses the listed substance? Circle the appropriate response.

Yes ..... (1)

No 2

A General Emergency Procedure manual is located in the admininstration building. A specific clean-up response is attached to each operating standard located on the production floor.

If yes, where are copies of the plan maintained? _____

Has this plan been coordinated with state or local government response organizations? Circle the appropriate response.

Yes ..... (1)

No 2

9.23 Who is responsible for monitoring worker safety at your facility? Circle the appropriate response.

Plant safety specialist 1

Insurance carrier 2

OSHA consultant 3

Other (specify) _____ 4

[X] Mark (X) this box if you attach a continuation sheet.

9.21 Do you have a written medical action plan for responding to routine or emergency exposure to the listed substance?

Routine exposure

Yes 1

No 2

Emergency exposure

Yes 1

No 2

If yes, where are copies of the plan maintained?

Routine exposure: _____

Emergency exposure: _____

9.22 Do you have a written leak and spill cleanup plan that addresses the listed substance? Circle the appropriate response.

Yes ..... (1)

No 2

If yes, where are copies of the plan maintained? Work Area

Has this plan been coordinated with state or local government response organizations? Circle the appropriate response.

Yes Through Chess & Care Committees ..... (1)

No 2

9.23 Who is responsible for monitoring worker safety at your facility? Circle the appropriate response.

Plant safety specialist 1

Insurance carrier 2

OSHA consultant 3

Other (specify) Line Supervisor 4

[ ] Mark (X) this box if you attach a continuation sheet.

SECTION 10 ENVIRONMENTAL RELEASE

General Instructions:

Complete Part E (questions 10.23-10.35) for each non-routine release involving the listed substance that occurred during the reporting year. Report on all releases that are equal to or greater than the listed substance's reportable quantity value, RQ, unless the release is federally permitted as defined in 42 U.S.C. 9601, or is specifically excluded under the definition of release as defined in 40 CFR 302.3(22). Reportable quantities are codified in 40 CFR Part 302. If the listed substance is not a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and, thus, does not have an RQ, then report releases that exceed 2,270 kg. If such a substance however, is designated as a CERCLA hazardous substance, then report those releases that are equal to or greater than the RQ. The facility may have answered these questions or similar questions under the Agency's Accidental Release Information Program and may already have this information readily available. Assign a number to each release and use this number throughout this part to identify the release. Releases over more than a 24-hour period are not single releases, i.e., the release of a chemical substance equal to or greater than an RQ must be reported as a separate release for each 24-hour period the release exceeds the RQ.

For questions 10.25-10.35, answer the questions for each release identified in question 10.23. Photocopy these questions and complete them separately for each release.

PART A GENERAL INFORMATION

10.01 Where is your facility located? Circle all appropriate responses.

CBI

[ ] Industrial area ..... (1)

Urban area ..... (2)

Residential area 3

Agricultural area ..... (4)

Rural area 5

Adjacent to a park or a recreational area 6

Within 1 mile of a navigable waterway ..... (7)

Within 1 mile of a school, university, hospital, or nursing home facility 8

Within 1 mile of a non-navigable waterway 9

Other (specify) _____ 10

[ ] Mark (X) this box if you attach a continuation sheet.

10.02 Specify the exact location of your facility (from central point where process unit is located) in terms of latitude and longitude or Universal Transverse Mercader (UTM) coordinates.

Latitude ..... 44 ° 47 ' 19N "

Longitude ..... 92 ° 54 ' 14W "

UTM coordinates ..... Zone _____, Northing _____, Easting _____

10.03 If you monitor meteorological conditions in the vicinity of your facility, provide the following information.

Average annual precipitation ..... _____ inches/year

Predominant wind direction ..... _____

10.04 Indicate the depth to groundwater below your facility.

Depth to groundwater ..... _____ meters

10.05 For each on-site activity listed, indicate (Y/N/NA) all routine releases of the listed substance to the environment. (Refer to the instructions for a definition of Y, N, and NA.)

CBI

[ ]

On-Site Activity	Environmental Release		
	Air	Water	Land
Manufacturing	NA	NA	NA
Importing	NA	NA	NA
Processing	Y	N	N
Otherwise used	NA	NA	NA
Product or residual storage	Y	N	N
Disposal	N	N	N
Transport	N	N	N

[ ] Mark (X) this box if you attach a continuation sheet.

10.06 **Provide the following information for the listed substance and specify the level of precision for each item. (Refer to the instructions for further explanation and an example.)**

CBI

[ ]	*	**Quantity discharged to the air**	411	**kg/yr ±** 10 **%**
		Quantity discharged in wastewaters	0	**kg/yr ±** 0 **%**
	X	**Quantity managed as other waste in on-site treatment, storage, or disposal units**	7	**kg/yr ±** 10 **%**
		Quantity managed as other waste in off-site treatment, storage, or disposal units	NA	**kg/yr ±** 0 **%**

* From SARA III reporting, for fugitive emissions around TDI bulk tank using formula from the 3M advisor issued 5/6/88.

No point source emissions according to sampling results of roof vents for pounds of carbon emitted.

Data based on extrapolation of limited sampling data; engineering estimate by weight.

X < 1.0% residual TDI in filter stream.

[ ] **Mark (X) this box if you attach a continuation sheet.**

10.08 Describe the control technologies used to minimize release of the listed substance for each process stream containing the listed substance as identified in your process block or residual treatment block flow diagram(s). Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization

Stream ID Code	Control Technology	Percent Efficiency
7Y	Release to atmosphere	N/A

[X] Mark (X) this box if you attach a continuation sheet.

10.08 Describe the control technologies used to minimize release of the listed substance for each process stream containing the listed substance as identified in your process block or residual treatment block flow diagram(s). Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Stream ID Code	Control Technology	Percent Efficiency
7N	Release to atmosphere	N/A

[ ] Mark (X) this box if you attach a continuation sheet.

PART B RELEASE TO AIR

10.09 CBI [ ] Point Source Emissions -- Identify each emission point source containing the listed substance in terms of a Stream ID Code as identified in your process block or residual treatment block flow diagram(s), and provide a description of each point source. Do not include raw material and product storage vents, or fugitive emission sources (e.g., equipment leaks). Photocopy this question and complete it separately for each process type.

Process type ..... Batch TDI Polymerization

Point Source ID Code	Description of Emission Point Source
N/A	No point source emissions according to SARA III

[X] Mark (X) this box if you attach a continuation sheet.

PART B RELEASE TO AIR

10.09 CBI [ ] Point Source Emissions -- Identify each emission point source containing the listed substance in terms of a Stream ID Code as identified in your process block or residual treatment block flow diagram(s), and provide a description of each point source. Do not include raw material and product storage vents, or fugitive emission sources (e.g., equipment leaks). Photocopy this question and complete it separately for each process type.

Process type ..... Continuous Urethane Polymerization

Point Source ID Code	Description of Emission Point Source
7N	Roof vent

[ ] Mark (X) this box if you attach a continuation sheet.

[X] Mark (X) this box if you attach a continuation sheet.

10.10 Emission Characteristics - - Characterize the emissions for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI	Point Source ID Code	Physical State[1]	Average Emissions (kg/day)	Frequency[2] (days/yr)	Duration[3] (min/day)	Average Emission Factor[4]	Maximum Emission Rate (kg/min)	Maximum Emission Rate Frequency (events/yr)	Maximum Emission Rate Duration (min/event)
[ ]	7N	G	.661	130	480	.0056	.0025	15	2286

[1]Use the following codes to designate physical state at the point of release:
G = Gas; V = Vapor; P = Particulate; A = Aerosol; O = Other (specify) _____

[2]Frequency of emission at any level of emission

[3]Duration of emission at any level of emission

[4]Average Emission Factor — Provide estimated (± 25 percent) emission factor (kg of emission per kg of production of listed substance)

[ ] Mark (X) this box if you attach a continuation sheet.

10.10 Emission Characteristics - - Characterize the emissions for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

[ ]

* None according to SARA Title III reporting

Point Source ID Code	Physical State[1]	Average Emissions (kg/day)	Frequency[2] (days/yr)	Duration[3] (min/day)	Average Emission Factor[4]	Maximum Emission Rate (kg/min)	Maximum Emission Rate Frequency (events/yr)	Maximum Emission Rate Duration (min/event)
*	N/A							
(None according to SARA III reporting)								

[1]Use the following codes to designate physical state at the point of release:
G = Gas; V = Vapor; P = Particulate; A = Aerosol; O = Other (specify) _____

[2]Frequency of emission at any level of emission

[3]Duration of emission at any level of emission

[4]Average Emission Factor — Provide estimated (± 25 percent) emission factor (kg of emission per kg of production of listed substance)

10.11 Stack Parameters -- Identify the stack parameters for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

[ ]

Batch TDI Polymerization Process

Point Source ID Code	Stack Height(m)	Stack Inner Diameter (at outlet) (m)	Exhaust Temperature (°C)	Emission Exit Velocity (m/sec)	Building Height(m)[1]	Building Width(m)[2]	Vent Type[3]
No point source emissions (Not Applicable)							

[1]Height of attached or adjacent building

[2]Width of attached or adjacent building

[3]Use the following codes to designate vent type:

H = Horizontal
V = Vertical

[X] Mark (X) this box if you attach a continuation sheet.

10.11 Stack Parameters -- Identify the stack parameters for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

[ ]

Point Source ID Code	Stack Height(m)	Stack Inner Diameter (at outlet) (m)	Exhaust Temperature (°C).	Emission Exit Velocity (m/sec)	Building Height(m)[1]	Building Width(m)[2]	Vent Type[3]
7N	2.1	.54 x .34	100	16	≃11	480' x 275'	V

[1]Height of attached or adjacent building

[2]Width of attached or adjacent building

[3]Use the following codes to designate vent type:

H = Horizontal
V = Vertical

[ ] Mark (X) this box if you attach a continuation sheet.

10.12 If the listed substance is emitted in particulate form, indicate the particle size distribution for each Point Source ID Code identified in question 10.09. Photocopy this question and complete it separately for each emission point source.

CBI

[ ] Point source ID code ..... Not Applicable

Size Range (microns)	Mass Fraction (% ± % precision)
< 1	
≥ 1 to < 10	
≥ 10 to < 30	
≥ 30 to < 50	
≥ 50 to < 100	
≥ 100 to < 500	
≥ 500	

Total = 100%

[ ] Mark (X) this box if you attach a continuation sheet.

PART C FUGITIVE EMISSIONS

10.13 Equipment Leaks -- Complete the following table by providing the number of equipment types listed which are exposed to the listed substance and which are in service according to the specified weight percent of the listed substance passing through the component. Do this for each process type identified in your process block or residual treatment block flow diagram(s). Do not include equipment types that are not exposed to the listed substance. If this is a batch or intermittently operated process, give an overall percentage of time per year that the process type is exposed to the listed substance. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Batch TDI Polymerization

Percentage of time per year that the listed substance is exposed to this process type ..... 20 %

Equipment Type	Number of Components in Service by Weight Percent of Listed Substance in Process Stream					
	Less than 5%	5-10%	11-25%	26-75%	76-99%	Greater than 99%
Pump seals[1]						
Packed	N/A	N/A	N/A	N/A	N/A	N/A
Mechanical	N/A	N/A	N/A	N/A	N/A	N/A
Double mechanical[2]	N/A	N/A	N/A	N/A	N/A	N/A
Compressor seals[1]	N/A	N/A	N/A	N/A	N/A	N/A
Flanges	8	N/A	24	N/A	N/A	5
Valves						
Gas[3]	N/A	N/A	12	N/A	N/A	N/A
Liquid	8	N/A	N/A	N/A	N/A	16
Pressure relief devices[4] (Gas or vapor only)	4	N/A	N/A	N/A	N/A	2
Sample connections						
Gas	N/A	N/A	N/A	N/A	N/A	N/A
Liquid	N/A	N/A	N/A	N/A	N/A	N/A
Open-ended lines[5] (e.g., purge, vent)						
Gas	N/A	N/A	N/A	N/A	N/A	N/a
Liquid	N/A	N/A	N/A	N/A	N/A	N/A

[1]List the number of pump and compressor seals, rather than the number of pumps or compressors

10.13 continued on next page

[X] Mark (X) this box if you attach a continuation sheet.

PART C FUGITIVE EMISSIONS

10.13 Equipment Leaks -- Complete the following table by providing the number of equipment types listed which are exposed to the listed substance and which are in service according to the specified weight percent of the listed substance passing through the component. Do this for each process type identified in your process block or residual treatment block flow diagram(s). Do not include equipment types that are not exposed to the listed substance. If this is a batch or intermittently operated process, give an overall percentage of time per year that the process type is exposed to the listed substance. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... Continuous Urethane Polymerization

Percentage of time per year that the listed substance is exposed to this process type ..... 65 %

Equipment Type	Number of Components in Service by Weight Percent of Listed Substance in Process Stream					
	Less than 5%	5-10%	11-25%	26-75%	76-99%	Greater than 99%
Pump seals[1]						
Packed	N/A	N/A	N/A	2	N/A	N/A
Mechanical	N/A	N/A	N/A	N/A	N/A	N/A
Double mechanical[2]	N/A	N/A	N/A	N/A	N/A	N/A
Compressor seals[1]	N/A	N/A	N/A	N/A	N/A	N/A
Flanges	N/A	N/A	N/A	N/A	N/A	N/A
Valves						
Gas[3]	N/A	N/A	N/A	N/A	N/A	N/A
Liquid	N/A	N/A	N/A	N/A	N/A	N/A
Pressure relief devices[4] (Gas or vapor only)	N/A	N/A	N/A	N/A	N/A	N/A
Sample connections						
Gas	N/A	N/A	N/A	N/A	N/A	N/A
Liquid	N/A	N/A	N/A	N/A	N/A	N/A
Open-ended lines[5] (e.g., purge, vent)						
Gas	N/A	N/A	N/A	N/A	N/A	N/A
Liquid	N/A	N/A	N/A	N/A	N/A	N/A

[1]List the number of pump and compressor seals, rather than the number of pumps or compressors

10.13 continued on next page

[ ] Mark (X) this box if you attach a continuation sheet.

10.13 (continued)

[2]If double mechanical seals are operated with the barrier (B) fluid at a pressure greater than the pump stuffing box pressure and/or equipped with a sensor (S) that will detect failure of the seal system, the barrier fluid system, or both, indicate with a "B" and/or an "S", respectively

[3]Conditions existing in the valve during normal operation

[4]Report all pressure relief devices in service, including those equipped with control devices

[5]Lines closed during normal operation that would be used during maintenance operations

10.14 Pressure Relief Devices with Controls -- Complete the following table for those pressure relief devices identified in 10.13 to indicate which pressure relief devices in service are controlled. If a pressure relief device is not controlled, enter "None" under column c.

CBI

[ ]

a. Number of Pressure Relief Devices	b. Percent Chemical in Vessel[1]	c. Control Device	d. Estimated Control Efficiency[2]
4	< 5%	Rupture Disc	100%
1	> 99%	Rupture Disc	100%
1	> 99%	Conservation Vent	99%

[1]Refer to the table in question 10.13 and record the percent range given under the heading entitled "Number of Components in Service by Weight Percent of Listed Substance" (e.g., <5%, 5-10%, 11-25%, etc.)

[2]The EPA assigns a control efficiency of 100 percent for equipment leaks controlled with rupture discs under normal operating conditions. The EPA assigns a control efficiency of 98 percent for emissions routed to a flare under normal operating conditions

[X] Mark (X) this box if you attach a continuation sheet.

10.13 (continued)

[2]If double mechanical seals are operated with the barrier (B) fluid at a pressure greater than the pump stuffing box pressure and/or equipped with a sensor (S) that will detect failure of the seal system, the barrier fluid system, or both, indicate with a "B" and/or an "S", respectively

[3]Conditions existing in the valve during normal operation

[4]Report all pressure relief devices in service, including those equipped with control devices

[5]Lines closed during normal operation that would be used during maintenance operations

Continuous Urethane Polymerzation Process

10.14 Pressure Relief Devices with Controls -- Complete the following table for those pressure relief devices identified in 10.13 to indicate which pressure relief devices in service are controlled. If a pressure relief device is not controlled, enter "None" under column c.

CBI

[ ]

a. Number of Pressure Relief Devices	b. Percent Chemical in Vessel[1]	c. Control Device	d. Estimated Control Efficiency[2]
None			

[1]Refer to the table in question 10.13 and record the percent range given under the heading entitled "Number of Components in Service by Weight Percent of Listed Substance" (e.g., <5%, 5-10%, 11-25%, etc.)

[2]The EPA assigns a control efficiency of 100 percent for equipment leaks controlled with rupture discs under normal operating conditions. The EPA assigns a control efficiency of 98 percent for emissions routed to a flare under normal operating conditions

[ ] Mark (X) this box if you attach a continuation sheet.

10.15 Equipment Leak Detection -- If a formal leak detection and repair program is in place, complete the following table regarding those leak detection and repair procedures. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... N/A Batch TDI Polymerzation

Equipment Type	Leak Detection Concentration (ppm or mg/m^3) Measured at ____ Inches from Source	Detection Device[1]	Frequency of Leak Detection (per year)	Repairs Initiated (days after detection)	Repairs Completed (days after initiated)
Pump seals					
Packed	N/A				
Mechanical					
Double mechanical					
Compressor seals					
Flanges					
Valves					
Gas					
Liquid					
Pressure relief devices (gas or vapor only)					
Sample connections					
Gas					
Liquid					
Open-ended lines					
Gas					
Liquid					

[1]Use the following codes to designate detection device:

POVA = Portable organic vapor analyzer
FPM = Fixed point monitoring
O = Other (specify) _____

[X] Mark (X) this box if you attach a continuation sheet.

10.15 Equipment Leak Detection -- If a formal leak detection and repair program is in place, complete the following table regarding those leak detection and repair procedures. Photocopy this question and complete it separately for each process type.

CBI

[ ] Process type ..... N/A Continuous Urethane Polymerization

Equipment Type	Leak Detection Concentration (ppm or mg/m^3) Measured at ____ Inches from Source	Detection Device[1]	Frequency of Leak Detection (per year)	Repairs Initiated (days after detection)	Repairs Completed (days after initiated)
Pump seals	This question is N/A.				
Packed					
Mechanical					
Double mechanical					
Compressor seals					
Flanges					
Valves					
Gas					
Liquid					
Pressure relief devices (gas or vapor only)					
Sample connections					
Gas					
Liquid					
Open-ended lines					
Gas					
Liquid					

[1]Use the following codes to designate detection device:

POVA = Portable organic vapor analyzer
FPM = Fixed point monitoring
O = Other (specify) _____

[ ] Mark (X) this box if you attach a continuation sheet.

10.16 Raw Material, Intermediate and Product Storage Emissions - - Complete the following table by providing the information on each liquid raw material, intermediate, and product storage vessel containing the listed substance as identified in your process block or residual treatment block flow diagram(s).

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[ ]

Batch TDI Polymerzation

Vessel Type[1]	Floating Roof Seals[2]	Composition of Stored Materials[3]	Throughput (liters per year)	Vessel Filling Rate (gpm)	Vessel Filling Duration (min)	Vessel Inner Diameter (m)	Vessel Height (m)	Operating Vessel Volume (l)	Vessel Emission Controls[4]	Design Flow Rate[5]	Vent Diameter (cm)	Control Efficiency (%)	Basis for Estimate[6]
F	NA	99.9%	.72	4.2	240	3.05	6.72	45420	Conservation Vent	4.2gpm	7.6	99%	C

[1]Use the following codes to designate vessel type:

F = Fixed roof
CIF = Contact internal floating roof
NCIF = Noncontact internal floating roof
EFR = External floating roof
P = Pressure vessel (indicate pressure rating)
H = Horizontal
U = Underground

[2]Use the following codes to designate floating roof seals:

MS1 = Mechanical shoe, primary
MS2 = Shoe-mounted secondary
MS2R = Rim-mounted, secondary
LM1 = Liquid-mounted resilient filled seal, primary
LM2 = Rim-mounted shield
LMW = Weather shield
VM1 = Vapor mounted resilient filled seal, primary
VM2 = Rim-mounted secondary
VMW = Weather shield

[3]Indicate weight percent of the listed substance. Include the total volatile organic content in parenthesis

[4]Other than floating roofs

[5]Gas/vapor flow rate the emission control device was designed to handle (specify flow rate units)

[6]Use the following codes to designate basis for estimate of control efficiency:

C = Calculations
S = Sampling

[ ] Mark (X) this box if you attach a continuation sheet.

PART E NON-ROUTINE RELEASES

10.23 Indicate the date and time when the release occurred and when the release ceased or was stopped. If there were more than six releases, attach a continuation sheet and list all releases.

Release	Date Started	Time (am/pm)	Date Stopped	Time (am/pm)
1	N/A	N/A	N/A	N/A
2				
3				
4				
5				
6				

10.24 Specify the weather conditions at the time of each release.

Release	Wind Speed (km/hr)	Wind Direction	Humidity (%)	Temperature (°C)	Precipitation (Y/N)
1					
2					
3					
4					
5					
6					

[ ] Mark (X) this box if you attach a continuation sheet.

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